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IT is our aim, our ambition, our aspiration even, to build our Journal worthily and well, not for the hour only, but for future years; for the few men in the forefront of an enduring and a laborious Art; for the disciplined ranks of a distinguished Profession; for the young men—Architects to be—and for all who love a clustered column or a flying buttress, a traceried window or a Greek frieze; for the man, too, who honestly plumbs a jamb . . . . .

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THE
BUILDERS' JOURNAL
AND ARCHITECTURAL RECORD.

January 4, 1905. Vol. 21, No 517.
6, Great New Street, Fetter Lane, E.C.

Summary.

The London Building Acts Amendment Bill has now been printed. (This page.)

Four- and five-room houses have been erected at Saffron Walden at a cost (including ground) of £100 each. (Page 6.)

Work for the unemployed has been found by the Garden City Co., who ask for funds to enable 200 men to be employed for three months. (Page 6.)

Drainage operations in London that will cost £7,000,000 are now in progress or about to be commenced. (Page 13.)

The front of Milan Cathedral is to be reconstructed. (Page 10.)

Rotary kilns for burning Portland cement were tried in this country twenty years ago, though the difficulties presented then seemed insuperable. The process was developed in the United States and eventually perfected by Messrs. Hurry & Seamen, whose patents for Great Britain were recently purchased by the Associated Portland Cement Manufacturers (1900), Ltd. By the rotary process the slurry passes down the kiln and is calcined at the lower end, the hot clinker falling into another revolving cylinder and there cooled. The rotary kilns at the Swanscombe works are 70ft. long and about 6ft. in diameter. (Page 2.)

The rebuilding of St. Mark's Campanile, Venice, is not expected to be completed till 1909. The cost is estimated at £80,000. (Page 10.)

Mr. Rowntree is building a garden city outside York. (Page 10.)

A competition is to be held for a new building for the Mitchell Library, Glasgow. (Page 10.)

A very finely illustrated treatise on English furniture is now being issued in parts. (Page 13.)

£500,000 is proposed to be spent on street improvements in Rome. (Page 10.)

The deaths are announced of Mr. J. T. Wimperis, F.R.I.B.A., and Mr. W. G. Laws, M.I.M.E., M.I.C.E. (Page 9.)

The deputation from the Glasgow School of Art which visited the chief schools of art in France have issued their report. They observe that education is free throughout France, but no student can enter a school of art until he has passed an examination demanding preparatory instruction, which is provided in special preparatory schools. At Glasgow the deputation hope that, with the aid of the continuation classes of the School Board and the establishment of a preparatory school, the thorough preparation of students for the School of Art may be ensured. (Page 7.)

London Building Acts Amendment.

The text of the Bill which is to be introduced into Parliament this session to amend the Acts relating to buildings in London, and to confer various powers on the London County Council, has just been published. On p. 257 of our issue for November 16th last we recounted shortly the history of the Bill and the latest provisions which the L.C.C. Building Act Committee had added. In our issues for February 25th and March 4th, 1903, we published a detailed criticism of the first draft submitted to Parliament and withdrawn on March 4th, 1903, while the criticisms and suggestions of the Royal Institute of British Architects were published in our issue for February 17th, 1904. The Act is proposed to be divided into 16 parts, one more than formerly, the new part being Number VIII. and dealing with "means of escape in case of fire and provisions for reducing risk of fire in buildings." In Part I. there are various amendments of definitions. In Part II., formation and widening of streets, a number of regulations are given which have for their chief object the prevention of blind alleys and streets made simply with the object of cutting up sites for the utmost benefit of building speculators without regard to the main lines of traffic. Part III. deals with the lines of building frontage. There is nothing in this of special note, except that communication bridges between buildings above the level of the street may not be erected without consent, nor show-cases, &c., on forecourts. Part V. deals with open spaces about buildings and the height of buildings. By this the objectionable paragraph in the old Act which stipulates that the space at the rear of a building shall extend the whole width is modified with regard to corner sites, but 15ft. depth at the rear is required instead of 10ft. as hitherto. The ambiguous clause relating to the provision of open spaces or courts in buildings for the purpose of admitting light and air is remedied to a great extent, and provision is made for the proper ventilation of such spaces by an opening at the bottom. By clause 57 no building other than a domestic building can be erected within 12ft. of the open space provided in connection with a domestic building. By clause 59 no building other than a church or chapel shall be erected higher than the distance to the building on the opposite side of the road. In Part VI., construction of buildings, section 63 requires that any external wall facing the public way shall be carried up so as to form a parapet, similar to a party-wall. Such a regulation, however, is most regrettable from an artistic point of view. Another objectionable provision is that the heights of living-rooms shall be 9ft. instead of 8ft. 6ins. as formerly, and 8ft. 6ins. instead of 8ft. where constructed partially in the roof. This practically prevents the erection of cheap cottages for the working classes, and is quite absurd, because a low room economizes warmth, and ventilation is not obtained by increasing cubical contents: 7ft. 6ins. should be the minimum. A number of other regulations are included which are important in their way, but we will pass to the clauses affecting fire protection. All constructional ironwork is to be protected by concrete, brick, terra-cotta or metal lathing and plaster or cement not less than 2ins. thick. Churches, chapels and other public places of assembly are to have panic-doors. Shops are to be separated by party structures of fire-resisting materials. Buildings of a greater height than 50ft., buildings used partly as shops and partly for sleeping accommodation, or buildings giving such accommodation for more than twenty persons (other than in one family) are to be constructed in accordance with any requirements made by the Council for the prevention of the spread of fire. Means of escape in case of fire are to be provided. Cavities are not to be left between boarding or panelling and the walls. Clauses as to lift shafts are to be retrospective after seven years from the commencement of the Act. Means of access are to be provided to the roofs of all buildings over 25ft. in height. We shall return to these clauses later, though we may here observe that they seem eminently fitted to a large city like London. Among other general clauses are those stipulating that stairs shall not have a rise of more than 7½ins. nor a tread of less than 8½ins., clear of nosings, except in the case of winders; that every window 25ft. or more above the ground shall admit of being cleaned from the inside; and that the Council may make regulations with respect to iron or steel skeleton buildings. The Tribunal of Appeal is to have two members added, one appointed by the Council and one a barrister, the latter to act as chairman. The storage of wood and timber is wisely regulated, and the consent of the Council will have to be secured for the erection of sign-boards, frames or other advertisement structures, or cranes, &c., projecting from buildings. Power is also sought to appoint inspectors of building plant, machinery, scaffolding, shoring, &c. On the whole, the Act seems to be well conceived and will not require much modification, though of course it omits to deal with many subjects which architects desire in the interests of good design; these, however, are at present not within the range of practical politics. All contentious points are eliminated as far as possible from the measure, and it is to be hoped the opposition will not cause the Bill to be postponed still further, as there is immediate need for the revision of the existing Building Acts.

PORTLAND CEMENT.*

Some Notes on its Manufacture and Testing.

By H. K. G. BAMBER, Managing Director, The Associated Portland Cement Manufacturers (1900), Ltd.

THE manufacture of Portland cement originated on the Thames in the year 1824, as the outcome of a patent taken by Joseph Aspdin, the name "Portland" being given to the material by reason of its resemblance when set to the well-known building stone quarried at Portland, on the south coast of Dorsetshire. The cement was first made commercially at Swanscombe, Northfleet and Cliffe, at the works of "J. B. White & Brothers," "Robins" and "Francis," all three now forming part of the amalgamated works owned by the Associated Portland Cement Manufacturers (1900), Ltd.

The usefulness of this new material soon became apparent to engineers, architects and others, and it quickly superseded Roman cements and hydraulic limes, the only cementitious materials of this description then in use. Very little was known in the early days of its introduction, and the manufacture was carried out on very crude rule-of-thumb methods. It is only within the last two decades, and more especially in the latter, that any attempt has been made to conduct the manufacture on really scientific and up-to-date mechanical lines.

Until quite recent years

The Literature of the Subject

was of the most meagre description, but since the attempts of the manufacturer to produce cement in a more scientific way the subject has received a great deal more attention, and there are now available many works on the subject by various well-known scientists and experts, headed by the late Mr. John Grant, engineer to the then Metropolitan Board of Works. No doubt these books, describing more or less in detail the manufacture of cement by the older process, are well-known to most users of Portland cement, and no useful purpose will therefore be served by describing at length the older methods with which the various treatises deal.

Shortly,

The Old Process

consisted of mixing together chalk and clay (for many years the only materials used) in definite proportions: a difficult matter when it is remembered that it is only in recent years the assistance of the trained chemist has been utilized to check the composition in the early stages of manufacture, and that formerly this was done entirely by rule-of-thumb—the material frequently reaching the final stages of manufacture before defects were discovered arising from improper proportions of raw materials, which defects it was then practically impossible to remedy.

After mixing, the material was pumped or elevated into "backs," or reservoirs, where settlement could take place and a considerable percentage of the water used for amalgamating the chalk and clay could be removed by decantation and evaporation. (No doubt also one of the principal ideas of these backs was to neutralize, by storing in large quantities, the varying proportions of chalk and clay in the mixed material arising in the absence of proper scientific and chemical supervision, as now adopted in all modern works.) This mixture of chalk and clay was then removed by hand or pumped on to drying floors or chambers over the kilns, where the water remaining therein was evaporated by heat obtained from the process of calcining, to which process in its turn the dried material was subjected. The resulting clinker was then ground to a powder, producing the Portland cement as known to the trade.

For many years the consumer himself, knowing little or nothing of the material he was using, was entirely in the hands of the manufacturers as to the description of cement supplied, and no doubt this monopoly with the manufacturers of what knowledge there was on the subject was the cause of a great national industry, such as the manufacture of Portland cement, remaining for so many years unenlightened and following the unscientific practices of its infancy.

Experiments and Results.

The development of research and the carrying out of properly organized investigations into the manufacture and properties of Portland cement, more especially in Germany and America, compelled the English manufacturer, who had been somewhat tardy in this direction, to set about putting his works in order and remodelling them on scientific lines. The extension of knowledge of the subject soon resulted in other calcareous and silicious materials being experimented with for the manufacture of cement, and in many cases such materials, other than chalk and clay, have been found suitable for the purpose under proper methods of manufacture, with the result that works have sprung up in various parts of the country; but in no case are the materials so eminently adapted for the manufacture of the best quality of Portland cement as the chalk and clay found in the cradle of the industry on the Thames and the Medway.

Another result of the more general knowledge of the subject was the framing by the consumer, or rather by his architect or engineer, of many and various

Specifications,

whereby his intention was to ensure the provision for himself of a cement having certain qualities and peculiarities which conformed to his own ideas of the subject. It can be readily imagined how the difficulties of the manufacturers with their great *clientèle* have in this way been increased during the last decade. Many consumers have asked for cement of their own particular fancy, in some cases stipulating certain conditions in one clause made absolutely impossible by the requirements of the next, and with these the manufacturer has in some way to comply to give satisfaction to his customers. Fortunately for the manufacturer, this matter is now having the attention of the cement section of the Engineering Standards Committee, of which the writer is a member, and it is hoped that as a result of their deliberations a standard specification of the quality of cement, together with details as to the methods to be employed for testing the same, will be shortly compiled and published, to the mutual advantage of the consumer and the manufacturer.

As the principal object of this short paper is to bring to your notice the correct methods for practically testing cement on works, the various processes of the more modern manufacture will be shortly described, so that, in dealing with the question of testing, it will be possible to trace back to each particular process of manufacture the conditions which are, and must be, applied by the manufacturer to obtain a finished product which shall possess those qualities which will enable it to successfully pass the various tests required of it, and which will later have our consideration.

The Raw Materials,

chalk and clay, as used on the Thames and Medway, are of excellent description, the white chalk being practically pure and containing from 98 to 99 per cent. carbonate of lime with slight traces of silicates of alumina and oxide of iron. As quarried, it contains an average of 15 to 20 per cent. of water, depending largely on the depth of the pit. On the Thames this white chalk is exclusively used, the grey or lower chalk being found underlying the white chalk in the hills bounding the valley of the Medway.

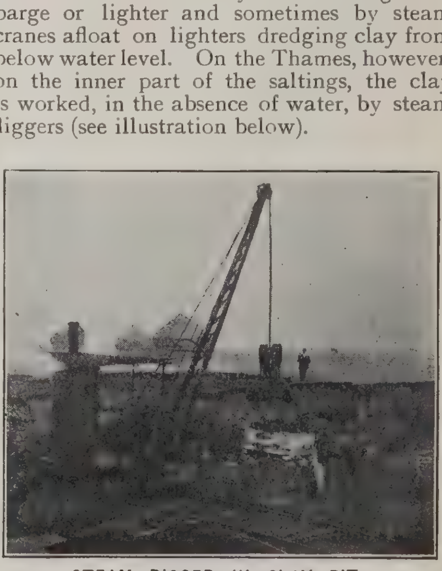
Quarrying.

Owing to the great depth of the quarry faces, about 80ft. to 100ft., no mechanical means can be employed for excavating the chalk, the same being quarried by manual labour directly into trucks for conveyance to the works. Great care is taken to remove from above the chalk all "callow," *i.e.*, gravel, loam, sand and hard contaminated chalk, locally known as "bull head," so that none but the pure chalk is used for the manufacture. To the archæologist this part of the work is full of interest, as, owing to the large area of ground being excavated annually, including the production of clay for brickmaking, articles of great antiquity and interest are continually being found. As the supplies of chalk immediately contiguous to the works have long since been worked out, it has been necessary to go further inland for material, necessitating steam or other traction to bring the raw material to the works.

GENERAL VIEW OF CHALK QUARRY.

On the Medway some white chalk is used, but in the upper reaches at the Associated Portland-cement works at Burham and Halling the lower or grey chalk is the chief source of supply. At the former works also gault clay, which crops up at this point, is used in place of the alluvial clays. The grey chalk differs somewhat in composition from the white, having mixed with it by nature a quantity of silicates of alumina, or in other words clay to the extent of about 10 per cent., the percentage of carbonate of lime ranging about 90.

The greater quantity of clay is obtained from the alluvial deposits known as "saltings" in the estuary of the Thames and Medway. On the latter, the material is obtained sometimes by hand-filling into barge or lighter and sometimes by steam cranes afloat on lighters dredging clay from below water level. On the Thames, however, on the inner part of the saltings, the clay is worked, in the absence of water, by steam diggers (see illustration below).



STEAM DIGGER IN CLAY PIT.

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* A paper read before the Clerks of Works' Association of Great Britain, at Carpenters' Hall, on September 12th, 1904.

WASHMILLS.

Mixture of Chalk and Clay.

The chalk and clay obtained by excavation are brought into the works and there carefully mixed by means of powerful machinery in fixed and definite proportions, in accordance with the requirements of the specification under which it is intended the cement manufactured therefrom is to be supplied.

The principal object of this part of the process is first to get the materials mixed in exactly the proper proportion, and this is done by the most careful and continuous system of sampling and analysis while the mixing is going on. Samples are taken every fifteen minutes, and so regular is the composition of the chalk and clay used that the chemists in charge of the various plants, working under a properly organized system, have no difficulty, by means of chemical tests, in keeping the proportions well within the prescribed limits.

Chemical Method Adopted.

The method adopted is to determine the amount of carbonic anhydride (CO_2) present in an accurately weighed amount of the dried mixture of chalk and clay. Chalk ($CaO.CO_2$) consists of 56 parts calcium oxide (CaO) chemically combined with 44 parts of carbonic anhydride (CO_2), and it can only occur in these fixed and definite proportions. By taking, therefore, an accurately weighed quantity of dried "slurry," and determining by means of proper apparatus the amount of CO_2 present, which can be done with great accuracy and rapidity, the amount of calcium carbonate present in the mixture can be immediately calculated. In addition to this, the precaution is taken of igniting another weighed quantity of the same dried sample and determining the loss of weight, which latter consists of all the carbonic anhydride (CO_2) and also any organic peaty matter that may have been introduced with the clay. By means of these two tests, carried out by thoroughly skilled chemists, the exact amount of calcium carbonate in the mixture is accurately determined; and seeing that both operations can be conducted and finished in a comparatively short space of time, a thorough knowledge of the composition is always available to the chemist, who makes the slight alterations in the proportion of materials whenever his tests show that such alterations are necessary. In this way the manufacturer nowadays, with the aid of chemistry, keeps his mixture exactly as required for the particular purposes.

Having ensured this, the next important step is to see that the materials are thoroughly amalgamated, in order that when later they are submitted to calcination the atoms going to make up same may be in the closest possible juxtaposition and in the smallest possible atoms. The chemical combination of the raw materials when submitted to the necessary process of calcination is very much more perfect than when the particles are appreciably larger and not intimately mixed; in fact, the combination of the silica and alumina of the clay with the lime (after the elimination of the carbonic anhydride from the chalk) can never properly take place unless the materials to be calcined are in the finest possible state of sub-division.

CLAY BEING TIPPED INTO WASHMILLS.

In the modern cement plants so perfectly is this part of the operation carried out that at least 96 per cent. of the chalk and clay delivered to the mixing and grinding mills is capable of passing through a sieve having 32,400 holes per square inch before it is delivered by the mill for conveyance to the storage mixers.

Some of the Associated Company's mills are capable of preparing the materials from the raw state to the fineness described at the rate of 50 tons per hour, the whole of this operation—as indeed the whole process—being under the direct supervision of the works' chemists.

Comparative Wire Screens.

Having brought the raw materials up to this point with a known composition, fineness and fluidity, the mixture of same—technically known as "slurry"—is pumped into large storage reservoirs, each having a capacity of slurry sufficient to make 600 tons of cement. In this way a more perfect mixture is secured, as the slightest variation experienced in the washmills is corrected again at this point by mixing in large bulk.

The mixers in use at the Associated Company's works effect a very great improvement in the quality of the product by the thorough system of incorporation, previous to the process of calcination, which immediately follows; the slurry in the mixers not being withdrawn until certified by the work's chemist that it is in every respect in accordance with requirements.

We now come to

The Second Part of the Process,

which is entirely of a chemical character—the process preceding it being purely mechanical. More attention, perhaps, has been given to improvement of this part of the process than to any other. Many forms and descriptions of kilns have been tried, but as they all necessitated very heavy charges for labour, and the fuel used was essentially coke—a relatively costly fuel, and one liable to unexpected and artificial fluctuations in price—they have not met with much economical success.

Among the most economical of these kilns is the Hoffman (which can be used only in cases where cement is made by the dry process).

Hoffman Kiln.

In this kiln coal only is used, with great economy in the quantity consumed as compared with the more ancient chamber kilns, but the amount of labour in charging and drawing the chambers is very excessive. Partly owing to this reason and to the fact that the wet process is more universally adopted in England, this kiln has not met with much success in this country.

Other types of continuous kiln are those known as the

Schneider and Shaft Kiln.

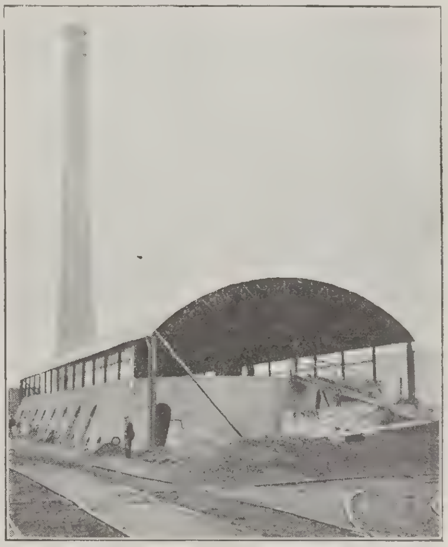
These consist of a vertical cylindrical shaft, with openings at the bottom for removing the burned clinker. The raw material and the fuel are fed in at the top of the kiln, as the materials fall therein, when the clinker is drawn from the bottom end.

This kiln is also very economical in fuel, but this advantage again is partly lost by the heavy labour bill entailed.

The Schoffer, Stein and Deitch kilns are also of this vertical shaft type, but have met with little favour in this country.

Dry Material fed in with Fuel.

With all these vertical continuous kilns it is essential that dry material shall be provided to be fed in with the fuel. There is no waste heat therefrom, consequent on the low consumption in the kiln, with which the wet raw material can be dried, the latter having to be dried by some auxiliary means, the cost of which both for labour and fuel has to be added for comparison with the working of the chamber kilns, which dry their own material with escaping heat from the previous charge, as already described.



HOFFMAN KILN, BURHAM WORKS.

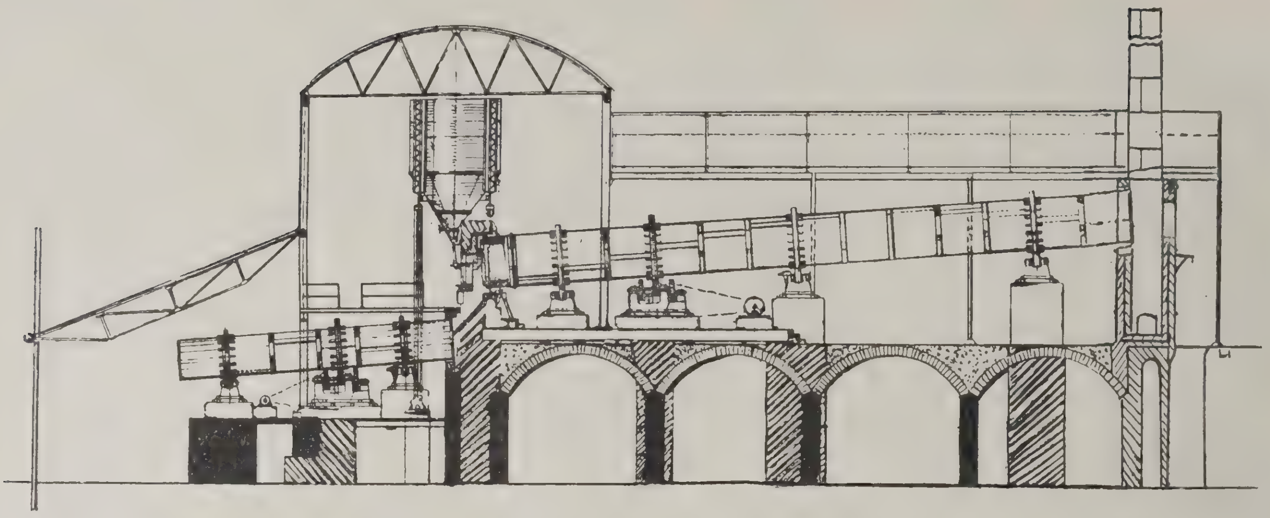
With all these kilns the operator has little or no control of the temperature at the part of the kiln where calcination is going on; and burned, as it must necessarily be, in fairly large pieces, so that the draught of the kiln is not impaired, a considerable portion of the product gets over-burned on the surface, leaving frequently a core of "half-burn," which it is difficult to remove and has a tendency to cause unsoundness in the finished cement.

The process of burning with

Rotary Kilns

was tried at two of the Associated Company's works as far back as 1885—the process patented by Mr. Frederick Ransome, A.M.I.C.E. Although a measure of success was obtained at these early trials, many difficulties presented themselves which at that time appeared to be insuperable. The use of pulverized coal had not come into practice at that time, and great difficulties were experienced in burning with producer gas. No satisfactory material could be found for lining the hottest part of the kiln, and owing to the shortness of the kiln—being only about 25ft. in length—no economical use of fuel could be obtained.

The ideas originated in the Ransome process were, however, developed in the United States, where the use of petroleum as fuel



SECTION OF ROTARY KILN PLANT, ARLESEY WORKS.

removed a great many of the early difficulties experienced in the experiments in England. The process was eventually brought to perfection by Messrs. Hurry & Seamen, whose patents for Great Britain were recently purchased by the Associated Portland Cement Company. The process developed very rapidly in America, and the rotary kiln is in almost all works in that country adopted for the calcination of Portland cement; the Atlas Works there, which own the Hurry & Seamen patents in that country, being by far the largest and most important works producing Portland cement of the best brands.

By the Rotary Process

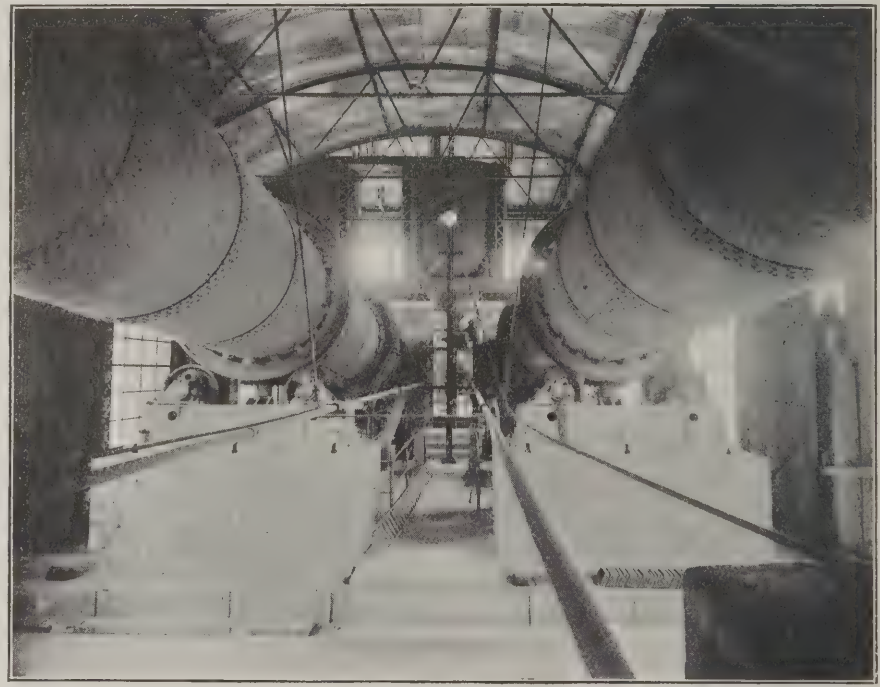
the prepared slurry—instead of being dried on "ovens" and "chamber kiln floors" with heat from the intermittent (old method) kilns, from which it had eventually to be removed when dry and packed with coke into these kilns at great expense for labour—is pumped from the mixers already described in a thoroughly homogeneous condition into the rotary kiln, down which it passes as the kiln rotates, the water being driven therefrom by the heat from the escaping gases evolved at the lower or calcining end of the kiln where a temperature of from 2,800 degs. to 3,000 degs. Fahr. is continually maintained.

The kilns are, in some cases, as at the Swanscombe works, 70ft. long, and in more recent practice, as at the Arlesey and Northfleet Works of the Associated Cement Company, 80ft. long and 6ft. in diameter. The power for rotating the kilns is obtained by means of electric motors, and the variations of speeds of rotation, necessitated by continual atmospheric changes, are entirely under the control of the operators in charge of the several units. It will be readily understood that nothing but the finest material and workmanship is possible in the construction of kilns of such length revolving on friction rollers carrying such great weights and subject to such varying conditions of temperature.

The Temperature necessary

for calcination at the lower end of the kiln is obtained from the combustion of pulverized bituminous coal, which is forced into the kiln by means of an air-blast, or other means,

VIEW OF VECTIS WORKS, ISLE OF WIGHT.



ROTARY KILNS AT ARLESEY WORKS.

where it immediately ignites. The supply of coal in regular quantities as required is provided by methods covered by the Hurry and Seamen patents, owned by the Associated Portland Cement Co., and the economy and efficiency of the process and the regularity in the qualities of the finished product depend largely upon the successful working of the machinery of this portion of the plant, which under the patent processes covered by Hurry and Seamen are entirely accomplished.

The slurry is pumped from the mixers, as already described, into the top end of the kiln, through which it gradually descends, first losing its water by evaporation in its passage down 20ft. of the kiln; it then reaches a temperature where all organic matter from the clay and carbonic anhydride (CO_2) is evolved, and descending further, and when within 20ft. of the lower end of the kiln, it reaches a zone of temperature ranging between 2,800 degs. and 3,000 degs. Fahr., when the chemical combination of the lime with the silicates of alumina takes place, producing

Portland-cement "Clinker."

The hot clinker falls from the end of the kiln into a somewhat similar cylinder, but of slightly smaller dimensions. During its passage though this second revolving cylinder, or "cooler," the heat brought over with the clinker is withdrawn by the passage of cold air through the tube, which becomes heated, and is eventually carried upwards by the induced draught of the kiln chimney into the kiln, where it assists combustion.

The rotary kiln produces clinker in appearance quite of a different character to that of the intermittent chamber or continuous shaft kiln. The raw material in its passage down the rotary kiln, as previously described, breaks up into small particles during the process of dehydration and decarbonization, and presents itself at the clinkering zone in very small particles, so that in its passage through this zone of fire the small particles are thoroughly and completely calcined to the centre, leaving no core of half-burnt raw material, as is frequently the case with the older methods of calcination in large pieces. This perfect calcination is the primary cause of the soundness of cement produced by this rotary process. The amount of fuel used, and therefore the temperature produced, is entirely under the control of the person operating the kiln, and by means of special apparatus provided under the Associated Company's patents he can reduce or increase at will, by altering the speed of rotation of the kiln, the amount of raw material coming towards the firing zone,

GENERAL VIEW OF ROTARY PLANT, SWANSCOMBE.

and also the amount of pulverized coal injected. By means of a pyrometer, or more often by long experience, the operator can gauge the exact point of temperature for the most economical production of a perfect cement clinker, which, being produced under most regular and continuous conditions of temperature, results in a thoroughly uniform product, owing to the complete chemical combination of the silicates of alumina and lime.

An Important Improvement

brought about by the rotary process is the elimination of the ash from the fuel from the cement clinker. In the older processes the ash from the coke and coal used for calcination must necessarily remain intermixed with the clinker in the kiln, from which it cannot be removed, whereas in the rotary process the fine ash derived from the coal is carried away out of the kiln and does not contaminate the clinker.

The Third and Final Process of Manufacture

is, like the first, entirely of a mechanical nature. The clinker, as produced by calcination in small pieces, is an absolutely inert material, and no chemical combination with water can take place until the clinker has been reduced by some mechanical means to the condition of a fine powder. This is a very important feature in the manufacture, as it is well known that the chemical action of the cement when subsequently gauged with water is in direct proportion with the fineness of the particles: the smaller the particles the greater the chemical activity, and therefore the cementitious value as a material of construction. For this reason the high-class finely-ground cements on the market are frequently much more economical in use owing to increased covering power, notwithstanding the higher price which is demanded for these high-grade cements.

SLURRY FEED ENDS OF ROTARY KILNS, SWANSCOMBE WORKS.

Crushing.

The reduction to powder of the cement clinker is obtained by means of several classes of machinery, all of a heavy and powerful kind, necessitated by the extreme hardness and refractory character of the material to be pulverized.

The method employed for many years, but now practically obsolete, was the reduction first by crushing in some form of stone-breaker, and finally by grinding through French burr millstones. This system, although very effective in times past, when a comparatively coarse ground cement was asked for, is much too costly in labour, power and repairs now that coarsely-ground cement has become almost a thing of the past.

Ball and Tube Mills.

The millstone has been superseded by many kinds of more modern machinery, such as mills of the vertical and horizontal edge runner type, but the class of machinery now found most economical and effective for very fine grinding is represented by the revolving tube system containing steel balls and flint pebbles, the mill containing the steel balls being described as the "Ball Mill" and the latter with pebbles as the "Tube Mill." The Ball Mill, as the preparatory grinder, consists of a revolving cylindrical chamber, the circumferential ends being set at an angle to the circumference, forming a series of steps as the mill revolves. The steel plates forming these ends are perforated, and as the mill revolves with a charge of 2 to 3 tons of steel balls rolling on the bottom and falling from step to step, the cement introduced is crushed by the falling and rolling action of the balls to a coarse powder, in which condition it passes through the perforations in the plates and falls on to a series of sieves: that fine enough to pass through these sieves constitutes the output of the mill: the coarser particles rejected by the sieves returning automatically beneath the steps as the mill rotates into the interior of the mill for further reduction.

The material from this mill is then introduced into a finishing mill or tube mill, a plain revolving cylinder about 26ft. long and 5ft. diameter carrying a charge of round stone flint pebbles sufficient to about half fill the mill. As this mill revolves the cement (in a coarsely ground state as delivered from the ball mill) is crushed between the large mass of rolling stones, and finally leaves the mill after passing from one end to

COOLERS AT SWANSCOMBE WORKS.

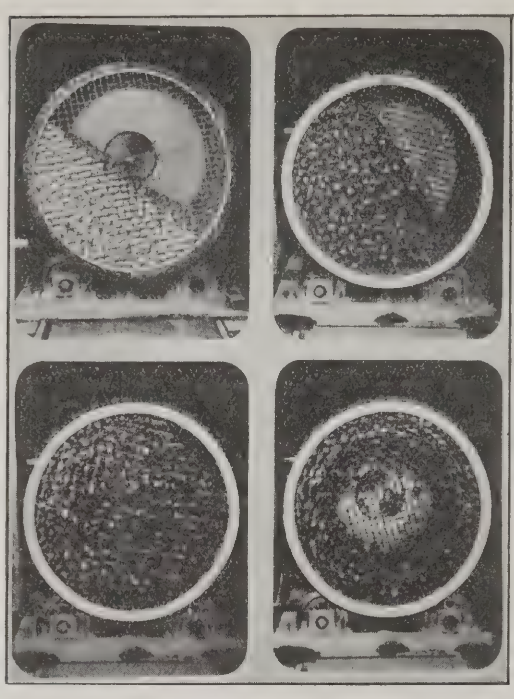
the other, during the whole time subject to attrition between the stones themselves and between the stones and the interior steel lining of the mills.

It will be understood that this is a very costly part of the manufacturing process, the cost of grinding being in inverse ratio to the fineness; the finer the powder, and therefore the more valuable article, the greater the cost to the manufacturer. The most modern practice in this department has led to the reduction of the clinker to such extreme fineness that all passes through a 50-mesh sieve, 98 per cent. through a 76-mesh sieve, 95 per cent. through a 100-mesh sieve, and from 80 to 85 per cent. through a 180-mesh sieve, the sieves mentioned corresponding to 2,500, 5,776, 10,000 and 32,400 holes per square inch respectively.

It is at this point of the manufacture that the regulation of the

Setting Time

of the cement is effected. A thoroughly well-made and finely-ground Portland cement is always, when first ground, very quick-setting. The more thorough the amalgamation of the raw materials the more perfect the calcination, and the finer the grinding the greater the chemical activity of the cement produced when mixed with water, and therefore the quicker the set.



INTERIORS OF TUBE MILLS REVOLVING AT DIFFERENT SPEEDS.

Except for work under water, a very quick-setting cement is not desirable, and therefore it is necessary for the manufacturer to neutralize the initial setting of the cement by one or other of the recognized methods. Hitherto this has been done by the addition of various small percentages of gypsum ($CaOSO_3$), but as some engineers have an objection to an admixture of this material the manufacturer was left to seek some other means of attaining the same object.

A New and very Effective System,

which has been in use now for some time, was patented by the Associated Portland Cement Co., and consists of subjecting the cement in the final stage of grinding to a moist atmosphere. This is done by injecting into the tube mill already described a quantity of steam, regulated at will, which keeps the atmosphere in the enclosed mill saturated with moisture, so that as the mill revolves carrying up and rolling over the stones and cement therein, every particle of the latter is subjected to a continuous and repeated process of superficial hydration, eventually leaving the mill in the finished condition, each molecule of cement equally treated. The process is one of great simplicity and follows quite natural lines. It is well known that a quick-setting, cement if allowed to become aërated by exposure to the atmosphere becomes slow-setting, and that in proportion to the period of aëration; it also improves in soundness by the neutralization of any particles of free lime present through the absorption of water and carbonic anhydride (CO_2) from the atmosphere. This action is very imperfect, however, when cement is stored in bulk, and can only be in a measure successfully accomplished by continually turning over the cement and exposing fresh surfaces for aëration.

The new system was perfected to overcome these difficulties, and it will be readily understood that the amount of hydration or aëration that each atom or particle of cement is subjected to under the new process during a period of one or two hours in the saturated atmosphere of the rolling tube mill is much more perfect than is the case when cement is stored in bulk and depends on absorption from the atmosphere for its aëration.

It is not generally known that the free or loosely combined lime in cement will not absorb carbonic anhydride from the atmosphere until it has first taken up moisture and become converted into the hydrate (slaked lime), in which condition it is free to absorb carbonic anhydride from the air being then converted into inert calcium carbonate.

The effect of the hydration process, as adopted by the Associated Portland Cement Manufacturers (1900) Ltd., is first to hydrate any trace of free lime present, thus improving the soundness of the cement, and, secondly, to hydrate the loosely chemically combined aluminates of lime, to which latter are attributed the quick initial setting properties of the cement.

The system permits of such minute regulation, depending on the amount of steam injected, that the setting time of the cement being produced can be permanently regulated to comply with the requirements of any specification, the total maximum absorption, even for a slow-setting cement, being less than 1 per cent.

Having passed this final stage of the manufacturing process, the cement is delivered to the warehouse, where it remains till the mechanical heat due to the friction of grinding is eliminated, when the cement is ready for immediate use.

The time at disposal will not admit of a more lengthy description of the three main processes, but from what has been said it will be seen what strides have been made during recent years in bringing the manufacture of Portland cement on to a thoroughly scientific basis. Sufficient has been said, however, to enable a comprehensive view to be taken of the various tests to which the cement has to be submitted in the hands of the consumer.

(To be concluded.)

Kirkstead Chapel, Lincs.—The Society for the Protection of Ancient Buildings has been drawing attention to this chapel, which belongs to a private owner who does not keep it in repair. The chapel is one of the most beautiful examples of pure Early English architecture, and has every claim to be carefully preserved as a national monument. Attention is also drawn to Carisbrooke Parish Church, a fine specimen of Perpendicular architecture. The bells are hung in such a way that the strain and vibration caused by their ringing are beginning to produce cracks in the stonework.

Builders' Notes.

Change of Address.—Messrs. A. Ransome & Co., Ltd., engineers and ironfounders, have moved from 304, King's Road, Chelsea, to 63, Queen Victoria Street, E.C.

Labour in the Colonies.—From a circular just issued by the Emigrants' Information Office, 31, Broadway, Westminster, it appears that there is a sufficiency of building trade labour in the Colonies, though New Zealand just now offers good employment.

The Extensions to the Withington Workhouse Infirmary, Manchester, are being warmed and ventilated by Shorland's double-fronted patent Manchester stoves with descending smoke flues and patent Manchester grates, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

£100 Houses of Concrete.—At Saffron Walden sixteen dwellings for artizans—eight in a block—have been erected at a cost (including ground) of £100 each. They contain some five and some four rooms, and have a separate washhouse and a garden back and front; and they let readily at 3s. 9d. per week. The kitchen is the biggest room in the house.

"Sand or other Suitable Material."—A Sheffield builder was fined £6 and costs (14s.) last week for constructing two dwelling-houses with defective mortar. Clayey matter had been used instead of sand. The defendant urged that the by-laws said "sand or other suitable material" was to be employed; the Bench, however, thought the material used in this particular case was not suitable.

Standardization of Water Fittings.—In their New River department the Metropolitan Water Board has a complete standard for all fittings, the result of the most accurate scientific study and many years of experience. They have a testing department 400ft. by 60ft., two storeys high, fitted up with all the most modern apparatus for examination, gauging and testing, and no fitting of any sort is allowed to be used until it has been taken to pieces, gauged and examined for interchangeability, quality and weight in every part, and then subjected to the necessary hydraulic test.

Garden City and the Unemployed.—The Garden City Co. have accepted an offer made by a lady to subscribe £700 for the employment of men recommended by the Mansion House Committee, and arrangements have been made to supply up to 100 men for about three months and to undertake the expense of providing accommodation and supervision. The first twenty men will be sent down to Hitchin this week. The Garden City Co. will pay the value of the work done to the extent of the above subscription. It is desirable, however, that the £700 should be supplemented by additional funds subscribed on the same basis, so as to bring up the total amount available for the special unemployed works to £2,000. This would permit over 200 men to be employed on productive and healthy work for at least three months. The directors are willing to grant shares for subscriptions given on the above footing, and will only use the money for paying for the actual work completed.

A new Workhouse Infirmary at Chesterfield has been erected at a cost of £40,000. In addition to the infirmary, a nurses' home, porter's lodge, boiler and engine-house, workshop, mortuary and disinfector have been erected, and certain structural alterations have also been made to the workhouse wards, &c. Messrs. Rollinson & Sons, of Chesterfield, were the architects, and Messrs. Maule & Co., of Nottingham and Chesterfield, the builders.

FRENCH ART SCHOOLS.

Report of a Glasgow Deputation.

THE deputation from the Glasgow School of Art, consisting of the chairman, Mr. James Fleming, with two other of the Governors, Mr. W. Forrest Salmon, F.R.I.B.A., and Mr. John J. Burnet, A.R.S.A., F.R.I.B.A., and the headmaster, Mr. Fra. H. Newbery, appointed to visit the more important of the national and municipal schools of art in France, have just issued their report in pamphlet form.

The schools visited were the Ecole Nationale des Beaux Arts, Lyons; Ecole Nationale et Speciale, Paris; Ecole des Arts Decoratifs, Paris; Ecole Nationale des Arts Industriels, Roubaix; and Ecole Municipale des Beaux Arts, Lille. It was not found possible, as at first intended, to visit the School of Art at Toulouse.

Introductions were obtained through the French Ambassador in London, M. Cambon, by the agency of the Scotch Education Department.

The deputation left Glasgow on January 15th, 1904, and returned on January 26th.

Lyons.

The schools of art in Lyons are (1) the Ecole Nationale des Beaux Arts controlled by the State, but having a local council of sixteen councillors; (2) four municipal schools, and (3) a municipal school of weaving.

Particulars of the courses of study in each school are given in the report.

An inspector of the fine arts is sent annually from the Ministry of Public Instruction and of the Fine Arts in Paris to report upon the work and efficiency of the schools. No fees are charged to students, all instruction being gratuitous.

The director and professors are paid fixed salaries by the municipality.

The school is supported by an annual grant. The budget covers an expenditure of about £4,000, of which the State furnishes about one-third.

In architecture there is no constructional side to the course other than geometry and perspective. These latter courses are, however, obligatory upon all students, as also the lectures on the history of art.

Paris.

In Paris the Ecole des Beaux Arts, Rue Bonaparte, is practically the University of Art not only for France but for the whole world. French students, sent as bursars by practically every city and town in France, form by far the majority, and among other countries contributing students perhaps America sends the most. Instruction throughout is free, and there is no registration fee. No students more than twenty-five years of age are admitted. Entrance examinations are held twice yearly, and these are very exacting. From painter, sculptor, architect and engraver candidates, admission work is demanded. Should this gain acceptance, other proofs follow to be executed before the candidate is permitted to be enrolled.

Architect candidates have to submit to, instead of submitting, a test of their powers of design, and have further to execute work in drawing from the antique and ornament, modelling, calculations and logarithms, arithmetic, algebra and elementary geometry, descriptive geometry applied to architecture, descriptive geometry, oral proofs of history knowledge, and a written composition.

The subjects taught at the school are drawing, painting, sculpture, architecture and engraving.

There is no section for decorative art, as commonly understood; nor does design for the manufactures form part of the curriculum. Mr. Henri Mayeux, however, gives an annual course of lectures on the decorative arts to students of the Ecole Nationale et Speciale des Beaux Arts. There are three ateliers for painting, three for modelling and three for architecture, each atelier receiving visits from a professor three times weekly; in addition lectures are given.

The whole system of teaching and study is based upon examinations for awards, competitions for prizes, and the submission of specified work for prizes and bursaries. All judgments are made by juries special to each section of school work, these juries being chosen by the professors among themselves.

The Architectural School is divided into first and second courses. A diploma of architecture is granted to students who successfully complete the work of these two courses. Besides the Grand Prix de Rome, belonging to the Institute de France and entitling the winner to a four years' residence at the Villa Medici or French state art school in Rome, the school is very rich in gifts and legacies, generally granted for special studies in the three arts respectively. The Foundation Chenavard is specially for poor students, and is divided among painters, sculptors, architects and gravers. The number of foundationers, as also the value of each respective bursary, is determined by the school council. The Société Centrale des Architectes Françaises appears as a donor, and a prize is given by American architects educated in the school. These gifts and legacies are outside the prizes and medals offered by the school itself.

The Ecole Nationale des Arts Decoratifs in the rue de l'Ecole de Medicine is, as its subtitle implies, a school for the application of fine arts to industry. All instruction is free.

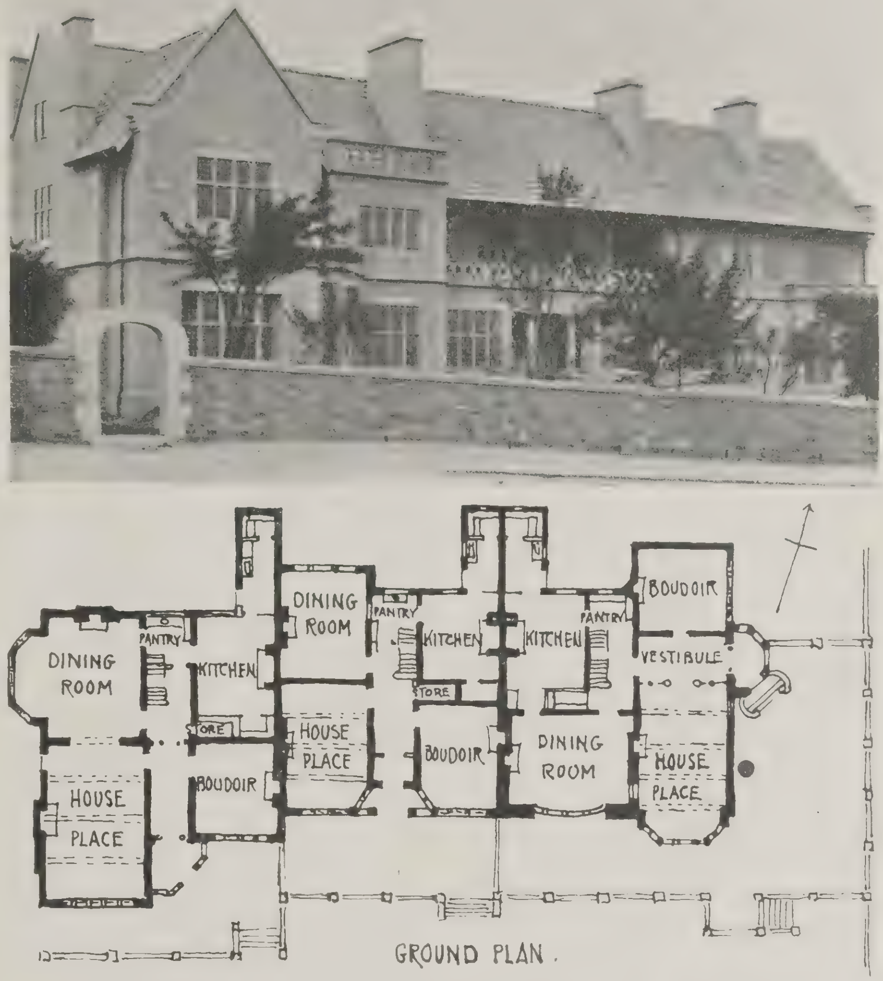
Candidates for admission submit either a study of ornament in light and shade, a modelled study, or an exercise in architecture, according as they wish to be enrolled in either one of the courses of drawing, modelling or architecture.

The subjects taken are drawing, modelling, geometry, plant study, architecture, mathematics, ornament and architectural composition, history of art, perspective and anatomy. There are special studios for ornament applied to industry (painted and modelled), and also a special atelier for architecture.

At the museum of architectural casts installed in the Palais de Trocadèro the Governors ordered a collection of casts for the use of the Glasgow School of Art. These consisted of figures from the Porte Royale of the Cathedral of Chartres, Corbeil, a complete doorway from Toule, Barye's lion and serpent, and other smaller specimens.

Roubaix.

At Roubaix the deputation visited the Ecole Nationale des Arts Industriels, which occupies a unique position in the scheme of French national art education. It was created as the result of an agreement in



THREE HOUSES AT HALIFAX. BUTLER WILSON AND OGLESBY, ARCHITECTS.

These houses have been erected on a building estate developed by the architects at Manor Heath, Halifax. An attempt has been made to gain an appearance of homogeneity by treating the exterior as a concrete structure, with an arrangement of plan which should shatter as little possible the ideal cherished of the Englishman, namely, that his house is his castle. The exterior walls are of split-faced wall-stones with tooled dressings, and the roofs of heavy grey slating. In each dwelling is contained a house place or common room lined with oak wainscotting and having an oak-beamed ceiling.

1882 between the State and the town of Roubaix. The institution embraces a school of art, a technical college, schools for weaving, dyeing and spinning, a picture gallery, an industrial museum, a museum of casts and a library.

The school is under the authority of the Ministry of Public Instruction and of the Fine Arts, and is administered by a council acting through an administrator nominated by the Minister.

The school is supported by a State grant and by an annual contribution from the town of Roubaix.

The deputation was struck with the business-like atmosphere pervading this school; and the earnestness and industry of the students were very apparent. The Administrator stated that students in many cases came straight from their work to the school. The subjects taught are chiefly those having direct bearing upon the industries and manufactures of the city, and the object of the authorities appears to be to keep thoroughly in touch with local demands. Students are received into the classes from eleven years of age, and the deputation was told that if the future occupation of the student was to be one connected with art industries, instruction in drawing took precedence of all other subjects in his ordinary education.

Lille.

At Lille the deputation visited the Ecole Municipale des Beaux Arts. This is not under the direct authority of the Ministry of Public Instruction, the actual administration being vested in a committee of twelve members, including the mayor of Lille, two painters, two sculptors, two architects, two engineers (nominated by the mayor), and two members nominated by the Ministry.

The aim of the school is to take children not less than nine years of age, and knowing how to read, write and arithmetic, and by courses of study to make them: (1) architects, painters, gravers and sculptors, ready to enter at the age of thirteen into the Ecole Nationale des Beaux Arts in Paris; (2) draughtsmen, surveyors, superintendents of bridges and roads; (3) foremen and workmen, well equipped intellectually in mechanics, carpentry, masonry, and as stone carvers, &c.

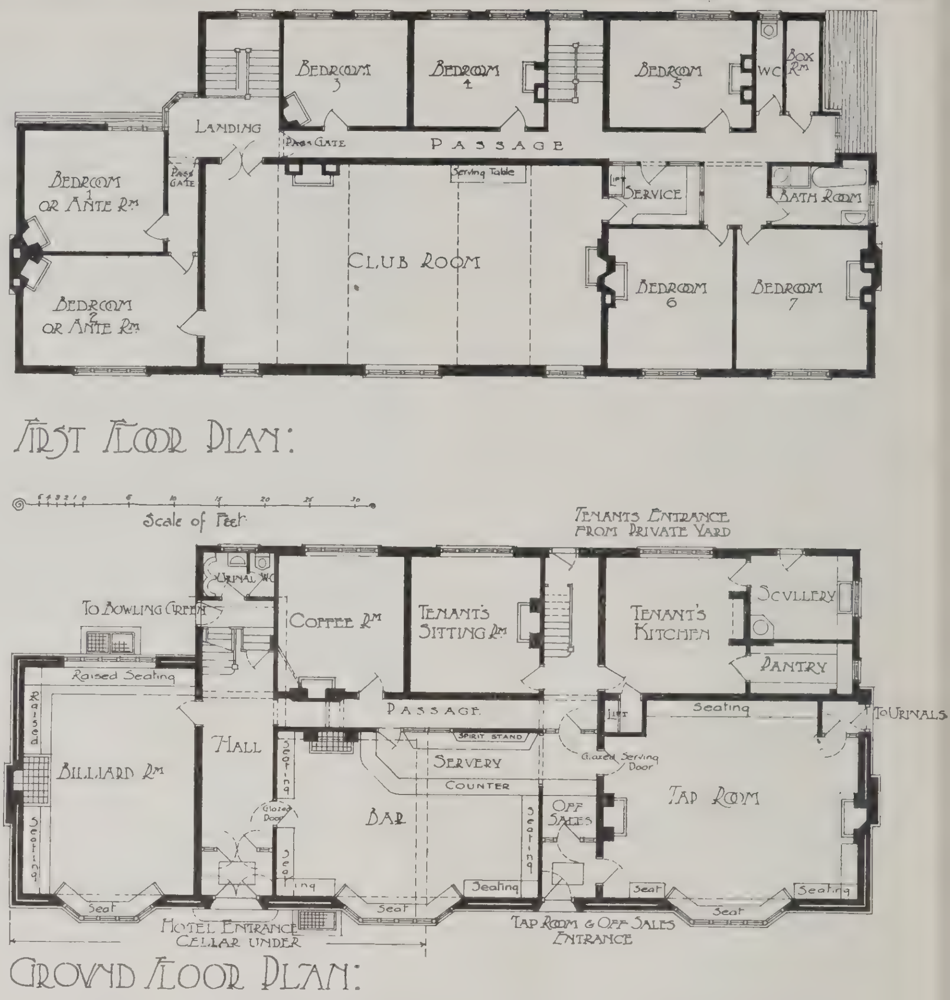
To obtain these results all students have to pass through an elementary course in a preparatory school in ornament, geometry, colour-washing, sketching, elementary architecture and building construction; and an advanced course in the school itself in ornament, descriptive geometry, statics, mechanics, modelling, antique, life painting, advanced architecture, perspective and the history of art. At the age of twelve years the students begin to specialize towards the end they have in view, as coming under the three heads above mentioned.

The instruction is free.

Conclusion.

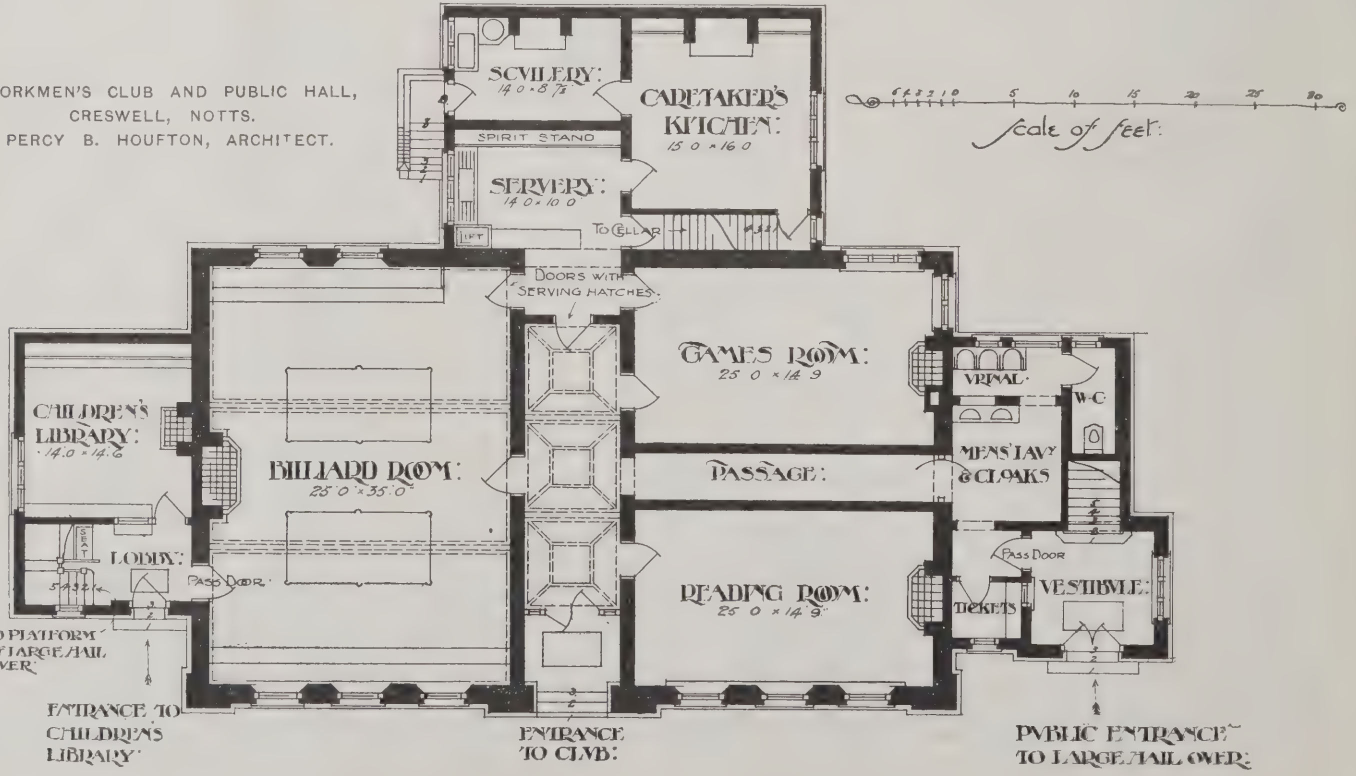
In concluding their report the deputation observe that in France education is free, but that no student may enter a school of art until he has passed an entrance examination. This examination demands preparatory instruction, which is provided for in special preparatory schools.

"The ordinary French student is compelled to follow a definite and rigorous course of training, which ensures a thoroughness



NEW INN AT BOLSOVER, DERBYSHIRE. PERCY B. HOUFTON ARCHITECT.

WORKMEN'S CLUB AND PUBLIC HALL, CRESWELL, NOTTS. PERCY B. HOUFTON, ARCHITECT.


Scullery: 14 0 × 8 7½
Caretaker's Kitchen: 15 0 × 16 0
Spirit Stand
Servery: 14 0 × 10 0
Lift
To Cellar
Scale of feet:
Doors with Serving Hatches
Games Room: 25 0 × 14 9
Urinal
W-C
Children's Library: 14.0 × 14.6
Billiard Room: 25 0 × 35 0
Passage:
Mens' Lavy & Cloaks
Seat
Lobby:
Pass Door
Pass Door
Reading Room: 25 0 × 14 9
Tickets
Vestibule:
To Platform of Large Hall Over
Entrance to Children's Library
Entrance to Club:
Public Entrance to Large Hall Over:

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Supplement to
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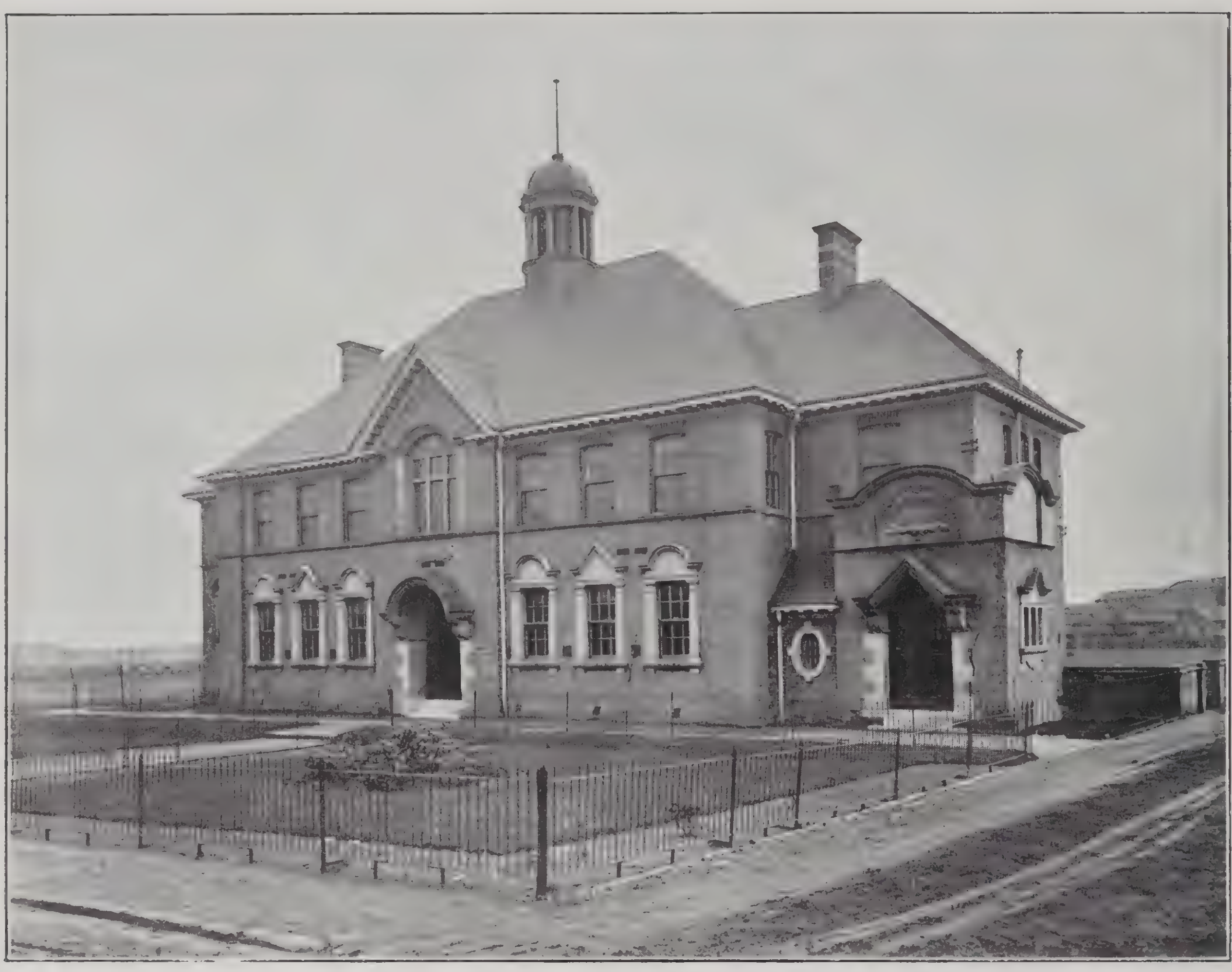
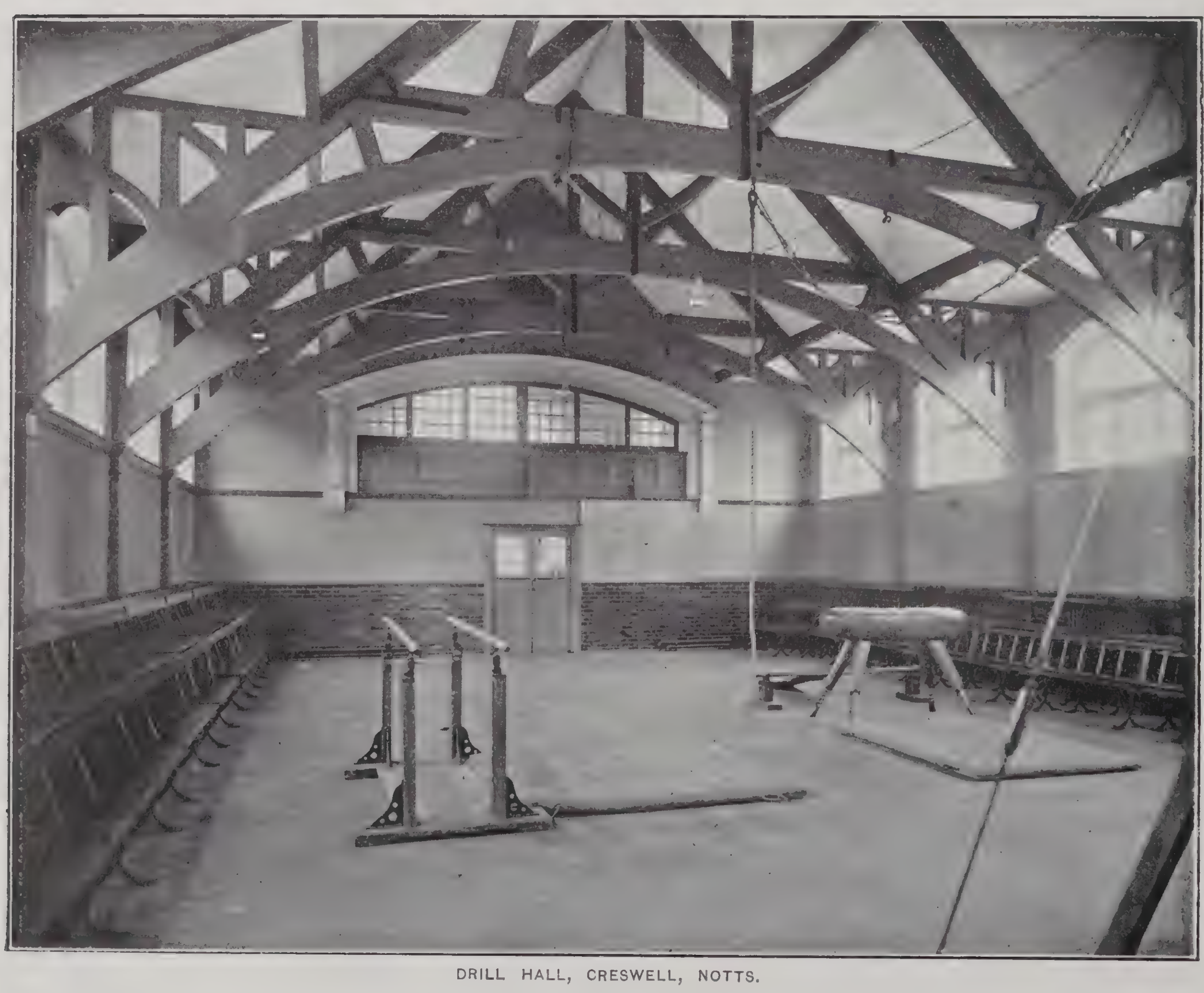


WORKMEN'S CLUB AND HALL, CRESWELL, NOTTS.



DRILL HALL, CRESWELL, NOTTS.

PERCY B. H

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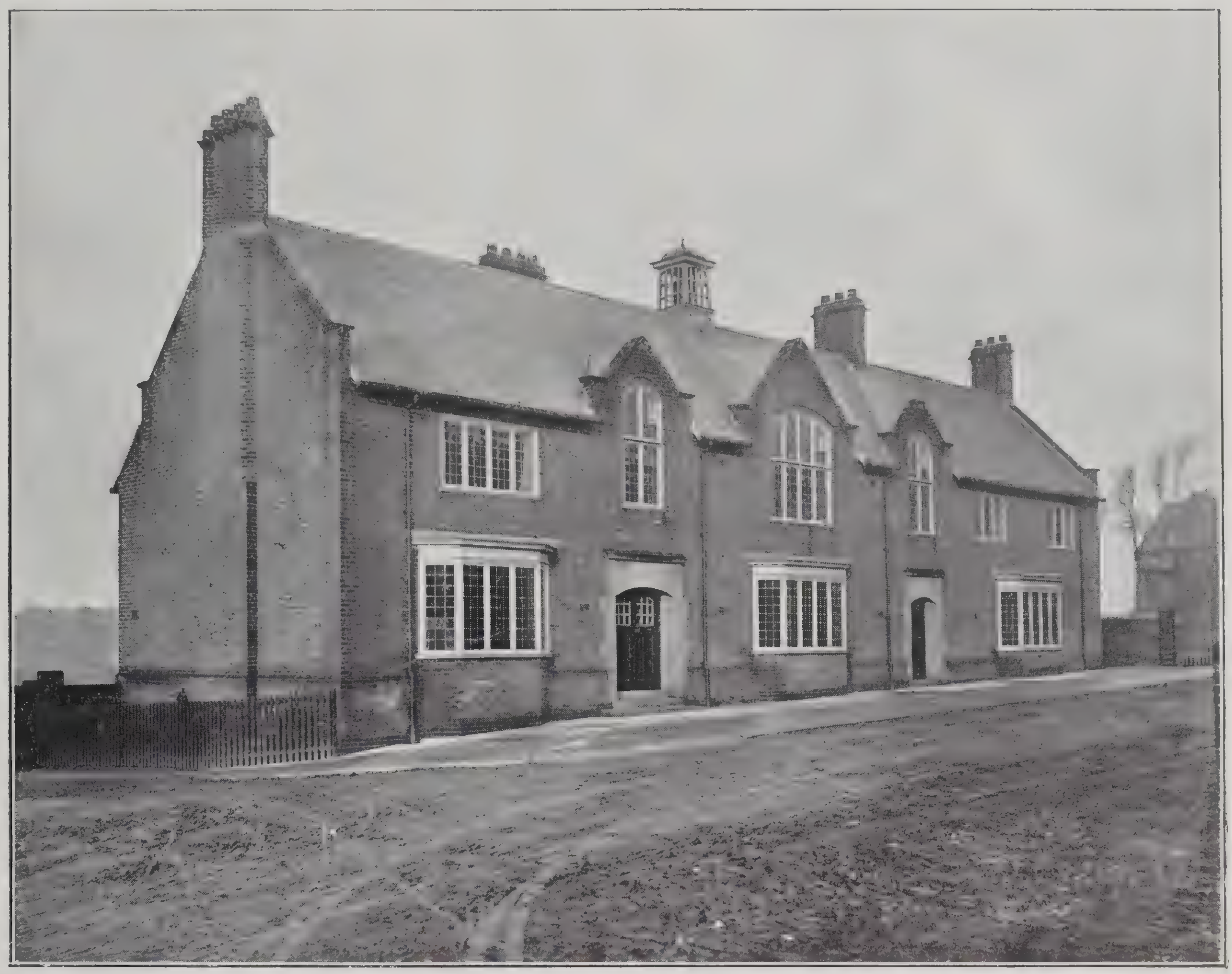
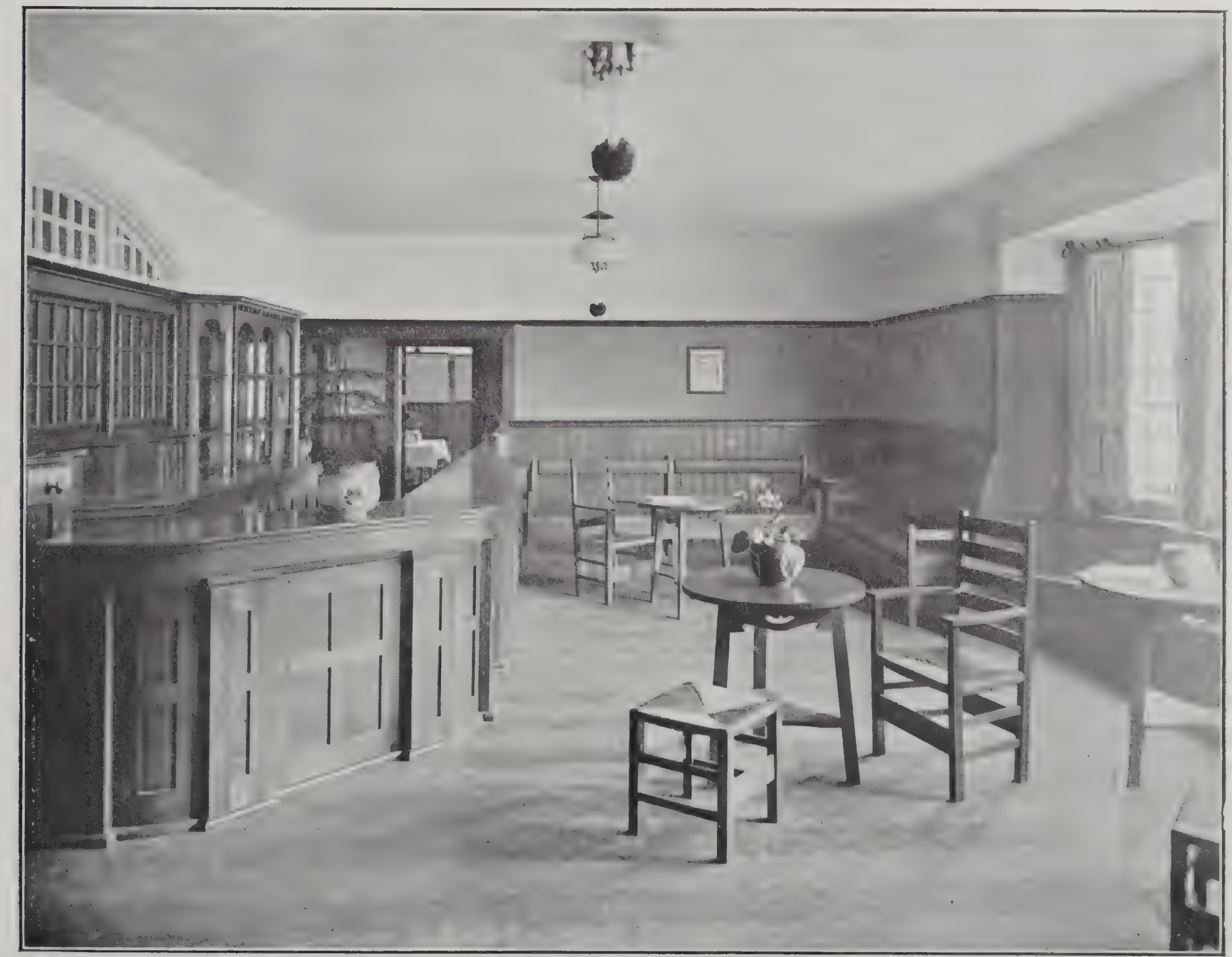


INN AT BOLSOVER, DERBYSHIRE.



BAR OF INN AT BOLSOVER.

, ARCHITECT.

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that has not as yet been possible to reach in Scotland. One of the reasons for this is that art education is felt everywhere in France to be an absolute necessity. It is encouraged alike by the State, by the civic authorities and by the manufacturers. The gratuitous instruction that everywhere prevails may partly account for the organization and methods to be found in the French schools. The French people take art and art instruction much more seriously than is the case in Scotland. . . ."

The deputation feel they have derived much good from their visit, and have gained an experience of work and methods which should be of great service to the Glasgow School of Art. It is hoped that by the aid of the continuation classes of the Glasgow School Board and by the establishment at some early date of a preparatory school, the thorough preparation of students for the Glasgow School of Art may be ensured.

The general excellence of the work of the School in drawing and painting will bear comparison with that produced by the Continental schools, but in architecture, advanced design and figure composition there remains much to be accomplished in Glasgow.

OUR PLATES.

THE new inn at Bolsover, Derbyshire, was erected for the Chesterfield Brewery Co., Ltd., to serve a country mining village of about 1,500 inhabitants. Stables and a bowling green are provided in the rear. Externally the materials are Leicestershire sand-faced bricks and green slates. The woodwork of the rooms is in some cases green stained pitch-pine and in others fumed American oak. The plaster is finished with a stucco surface and distempered in "Duresco." Oak tables and chairs were selected from Mr. John P. White's catalogue from the designs of Mr. M. H. Baillie Scott; the seating, counter and other fittings were executed in the same material by Messrs. Eyre & Sons, of Chesterfield, to the architect's designs. The walls have since been hung with Mr. Cecil Aldin's hunting prints. The general contractor was Mr. H. Oakey, of Bolsover, and the decorator Mr. C. Scott, of Mansfield. The total cost, including all fittings and laying-out the grounds, was £3,500. The architect was Mr. Percy B. Houfton, of Chesterfield.

A perspective of the exterior and a description of the drill-hall at Creswell, Notts, were given in our issue for April 29th, 1903. The architects were Mr. Percy B. Houfton, of Chesterfield, and Mr. F. C. R. Johnson, of Torquay.

The workmen's club and public hall at Creswell was erected for the Bolsover Colliery Co., Ltd., at their Creswell mining village. It serves the purpose of a workmen's club, a small children's library and a large meeting hall. As the club is not open to non-members, it is separated by pass-doors from the public hall entrance and the children's library. On the first floor is the hall, capable of seating about 400 persons; the small end wings provide respectively crush space with cloak-room accommodation and an ante-room in communication with the fixed platform. The materials are Mansfield stone, red bricks and tiles. Internally the rooms are fitted with oak seating and tables, the walls distempered and the ceilings treated with wooden cornices and moulded wood ceiling ribs. The roof of the large hall is open-framed. The coal fires are supplemented by a low-pressure heating system. The architect was Mr. Percy B. Houfton, of Chesterfield.

The Mattison board schools have been erected for the Hornsey School Board from the designs of Mr. Arnold Mitchell and Mr. Alfred Butler, joint architects. The general lay-out of the blocks is given at one corner of the illustration.

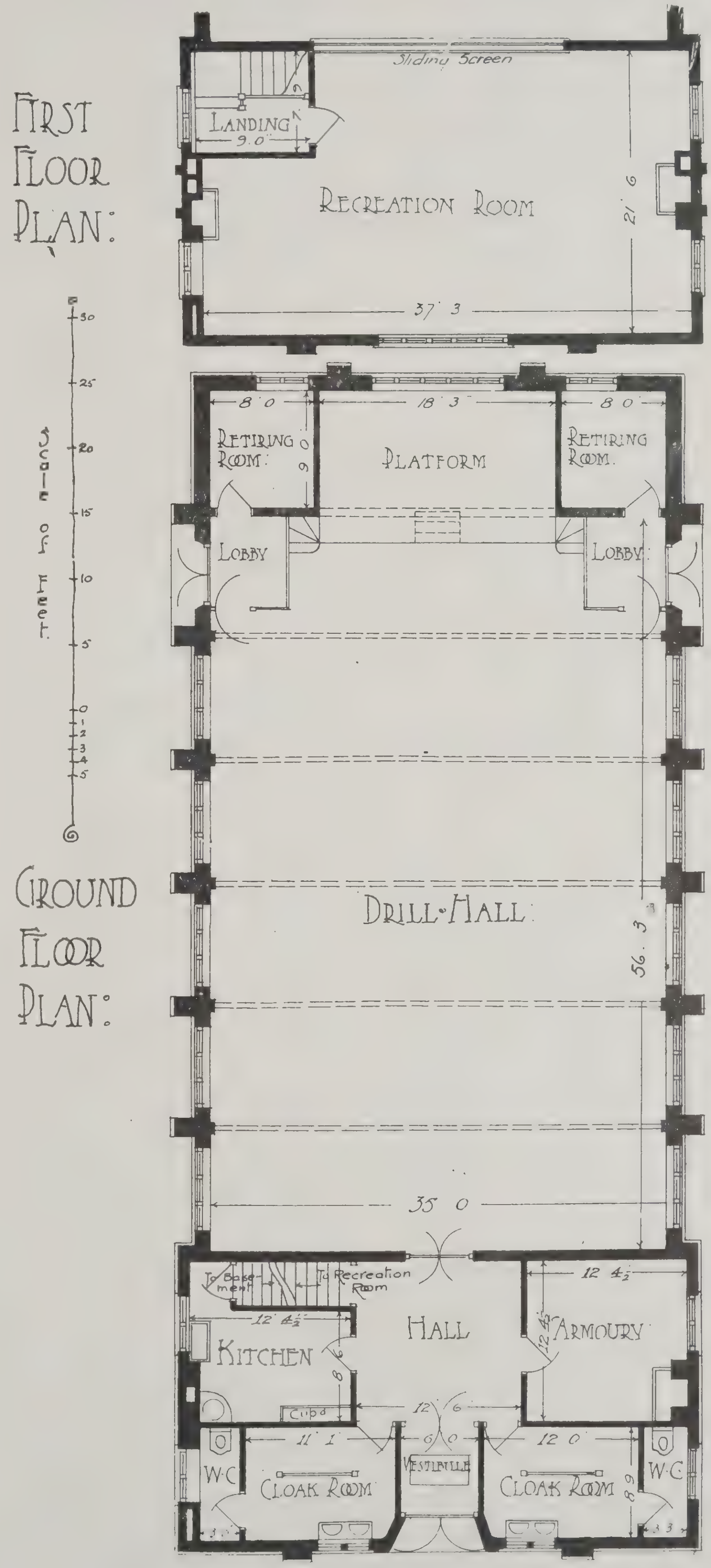
Obituary.

Mr. H. E. Stelfox, A.R.I.B.A., of Manchester, died recently, aged 49.

Mr. J. T. Wimperis, F.R.I.B.A., died on December 21st, aged 75. In 1889 he took Mr. W. H. Arber into partnership, which association existed till the end of 1897, when the partnership was dissolved and Mr. Arber purchased Mr. Wimperis's interest in the practice. A large number of hotel, domestic and business premises have been erected by the firm.

Mr. W. G. Laws, M.I.M.E., M.I.C.E., for many years city engineer and surveyor of Newcastle-on-Tyne, died recently, aged 62. He retired from this position in 1901, being then appointed consulting engineer.

The late Mr. Andrew M'Meckan, of Greenock, formerly of Cape Town, retired



DRILL HALL AT CRESWELL, NOTTS. PERCY B. HOUFTON AND F. C. R. JOHNSON, ARCHITECTS.

builder, who died in New York on October 7th last, left personal estate which has been valued at £31,612.

Mr. Arthur Ansell, builder, of Hitchin, died recently, aged 78.

Mr. John Ross, builder, of Aberdeen, died recently, aged 79. He retired from business six years ago.

Keystones.

The Vinery at Hampton Court Palace is being rebuilt by order of the King.

In the Chapter-house of Canterbury Cathedral a new west window has been executed by Mr. A. C. Hemming, of London, W.

At the Coliseum there is an interior scene at the "Spaniards" tavern, Hampstead Heath, furnished by Messrs. Oetzmann & Co., of 62-79, Hampstead Road, W.

Mr. Philip Watts, F.R.S., Director of Naval Construction, has been elected a vice-president of the Junior Institution of Engineers.

The Winter Exhibition of the Royal Academy is now open at Burlington House. Watts's equestrian statue of "Physical Energy" still remains in the quadrangle.

R.I.B.A. President's "At Home" will be held at Conduit Street, W., on Monday, January 16th, from 8.30 to 11, when there will be an exhibition of sculpture allied to architecture in modern work.

"A Novel Method of Roofing a Church."—Messrs. Hay & Henderson, of Edinburgh, were the architects under whose direction new roofs to Corstorphine Church were constructed by Messrs. Stuart's Granolithic Stone Co., Ltd., as described and illustrated in our issue for December 21st.

Kleinpflaster Roads are to be tried in England by Mr. William Oxtoby, borough engineer of Camberwell, and Mr. Brodie, the city engineer of Liverpool. The surface is practically a mosaic of undressed granite or basalt cubes made in about six different sizes, of which the most usual is 3½ins. by 3¼ins. by 4ins.

The Front of Milan Cathedral is to be reconstructed. The work, however, will occupy ten years. The lower part up to a height of about 50ft., including the five doors by Pellegrini, will be left untouched, but the several stages of windows at present existing will be replaced by single big windows (five in all) between the buttresses: and the crowning will be altered.

"Architectural and Building Events of 1904."—The bank illustrated at the bottom left-hand corner of p. 16 of the supplement to our issue for last week is not at Liverpool, but at Charing Cross, Birkenhead; also, in a paragraph on the same page, the architects of the new bank at the corner of Bold Street, Liverpool, are given as Messrs. Woolfall & Eccles, whereas Mr. J. Francis Doyle was the architect. We regret these errors, which, however, we may say were due to our having lost a slip with certain names and titles on it.

The Rebuilding of St. Mark's Campanile, Venice.—Nearly two years and a half have elapsed since St. Mark's Campanile fell, and it is calculated that four more years will be needed for its reconstruction, the cost of which is estimated at £80,000. Around the old foundations have been placed 3,000 piles of larch 10ft. in length. Venetian and Istrian stone, as well as cement, are being employed for the foundations. Roman pozzolana, the strongest kind of mortar, will be used in the construction of the new tower. The loggetta of Sansovino will be reconstructed out of the old pieces. It is calculated that the total weight of the new campanile will be 12,000 tons.

Herculaneum.—Professor Waldstein is in America lecturing on the proposed excavation of Herculaneum. President Roosevelt has associated himself with the scheme.

A new Technical School at Burnley is to be erected at a cost of about £60,000. The site forms part of the Bank Hall grounds. It comprises 10,000 sq. yds. and has cost £5,000.

The "International" will open its next exhibition on January 9th at the New Gallery, which will be arranged in accordance with a new scheme of decoration devised by M. Rodin, president of the Society.

Calendars for 1905 have been sent to us by Messrs. George Wragge, Ltd., of Manchester (designed by Mr. Sydney E. Castle), and by the Willesden Paper and Canvas Works, Ltd., of Willesden Junction, N.W.

New Banking Premises at Great Grimsby for the Union of London and Smith's Bank have been erected from designs by Mr. W. Campbell Jones, F.R.I.B.A., of London. Messrs. Hewins & Goodhand, of Grimsby, were the builders.

The Naval College at Dartmouth will be opened by the Prince of Wales on his return from Ireland. It will then have been two years under construction, the foundation-stone having been laid by the King in March, 1903. Sir Aston Webb and E. Ingress Bell are the architects.

Secret Commissions. — A Fellow of the Surveyors' Institution, in a letter to the "Times," protests against the practice of secret commissions of 10 and even 15 per cent. being received and, in many instances, demanded by surveyors, auctioneers and estate agents on builders' accounts for repairing, altering and decorating house property; and against commissions received on private sales of property from both vendor and purchaser.

At Nottingham Lunatic Asylum the temporary wood and iron dormitory containing forty beds for female patients is to be replaced by a permanent building, plans of which have been prepared by Mr. Frank B. Lewis, the city architect. The new building will be of two storeys, accommodation for forty patients being provided in one large dormitory on the ground floor, with thirteen single bedrooms above and one double bedroom for the use of the nurses. It is estimated that the total cost of the work will amount to £3,000.

The new Regent Bridge at Aberdeen Harbour was formally inaugurated last week. It takes the place of the old viaduct which for seventy-two years spanned the dock in the line of Marischal Street. The bridge has been in course of construction for six years and has cost about £60,000. The new passage is 67ft. wide, and is formed of granite masonry quay walls, the south wall or abutment being 190ft. long and the north 95ft. On the south abutment the new swing bridge rests, with the machinery below, while the pump house and dock offices occupy the west corner. The swing bridge itself is 156ft. long and weighs 700 tons. The engineers for the works have been Mr. Henry H. Wake, M.I.C.E., consulting engineer; Mr. R. Gordon Nicol, M.I.C.E., engineer-in-chief; Mr. William Simpson, A.M.I.C.E., executive engineer; and Messrs. Barr, Blackadder and Diack, assistant engineers. Sir William Arrol & Co., Ltd. (Glasgow), built the steelwork; Messrs. Glenfield & Kennedy, Ltd. (Kilmarnock), made the hydraulic machinery; and the railway work has been executed by Messrs. Hadfield's Steel Foundry Co., Ltd. (Sheffield). The Regent Bridge improvement scheme, of which the new bridge is the most important feature, includes also the widening (still in progress) of the quays. The total cost of the scheme is put at about £120,000.

Our new Telephone Numbers are 2200, 2201, 2202, 2203 and 2204 Holborn. The old number (416 Holborn) is discontinued.

Change of Address.—Mr. Arthur R. Groome, A.R.I.B.A., has moved from 2, St. Peter's Square, Manchester, to Palace Chambers, Hereford.

A Monument to W. E. Henley is to be erected in St. Paul's Cathedral. M. Auguste Rodin has offered to design a sculptured setting for his bust of Mr. Henley, which will be cast in bronze.

The Infectious Diseases Hospital, Settle, is to be erected at a cost of £4,000 from designs by Mr. T. A. Foxcroft, sanitary engineer to the council. Six sets of designs were submitted by architects, but rejected.

In Gibraltar Cathedral a brass to the memory of the late bishop has been erected from the design of Mr. R. Baker King, A.R.I.B.A., Westminster. Its setting, of alabaster, was supplied by Messrs. Harry Hems & Sons, of Exeter.

A new Garden City has been commenced by Mr. Rowntree at Earswick, about two miles from York. Thirty houses have been built and are already occupied, while eleven more are in course of erection, for all of which tenants are waiting. Most of the houses are let at 4s. 6d. per week, plus rates (about 8d. per week).

Iveagh House, Dublin, is now almost completed. It is to serve as a workmen's hotel or model lodging-house, and is the first building of the kind in Ireland. In detail it much resembles the Rowton Houses. There are 500 cubicles. A large block of artizans' dwellings is also nearing completion as portion of the Trust scheme.

Half a Million for the Improvement of Rome.—The municipal authorities of Rome propose to devote £500,000 to four important improvements, namely, the widening of the Via del Tritone (which is the Strand of Rome), the completion of the northern approach to the tunnel that has been bored beneath the Quirinal Gardens, and improvements at the new Ponte Umberto Primo (opposite the new Law Courts) and the approach to the new Ponte Gianicolense.

A new Baptist Church at Higham Hill has been built from designs by Mr. Edgar Stones, of London, at a total cost of about £5,500. It is Gothic in style, of red brick with stone dressings. The church (including the gallery which runs around three sides) accommodates about 800 worshippers and a hall below 600 scholars. The seating, in Orham wood, has been carried out by the Bennett Furnishing Co., Ltd., and the electric lighting and the ventilating fan and apparatus by the Ulcars Electric Co., of Stratford. Messrs. Jones & Sons, of London, are responsible for the hot-water system (low-pressure), and the inside clock was presented by Messrs. Sainsbury Brothers, church and turret clockmakers, of Walthamstow. The general contractor for the building was Mr. T. J. Coxhead, of Leytonstone.

Competition for Mitchell Library, Glasgow. - The Corporation of Glasgow propose to erect, in North Street, a new building for the Mitchell Library, including the Jeffrey Reference Library and the Moir collection, and have issued conditions of competition for the guidance of architects in preparing plans. No premium will be paid to the architect employed to carry out the work at the usual commission of 5 per cent.; but premiums of £100, £75 and 50 will be paid to the authors of the three designs placed by the assessors next in order of merit. Mr. John Keppie, F.R.I.B.A., the president of the Glasgow Institute of Architects, and Mr. McDonald, the city engineer, are the assessors. Designs are to be lodged by March 1st next, and are to be for a building to cost about £40,000.

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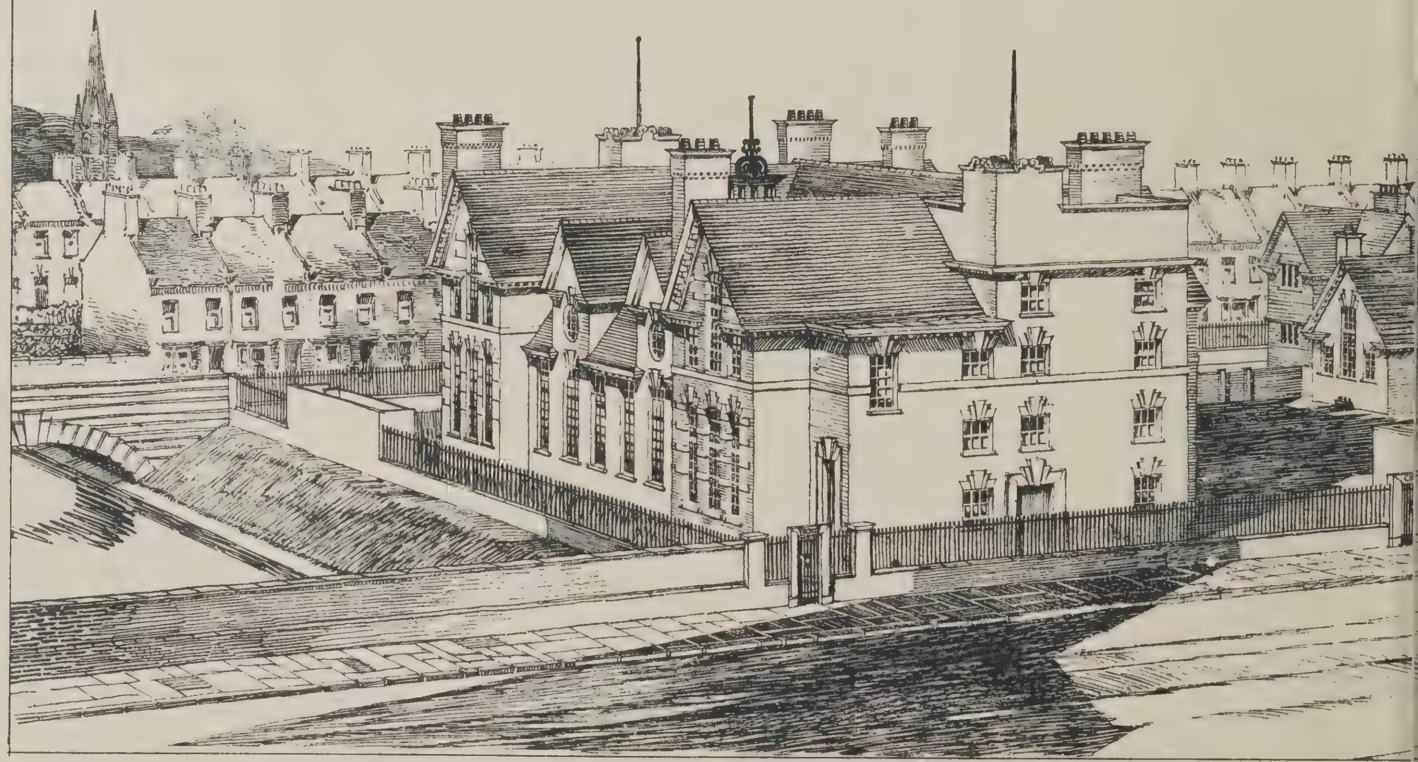
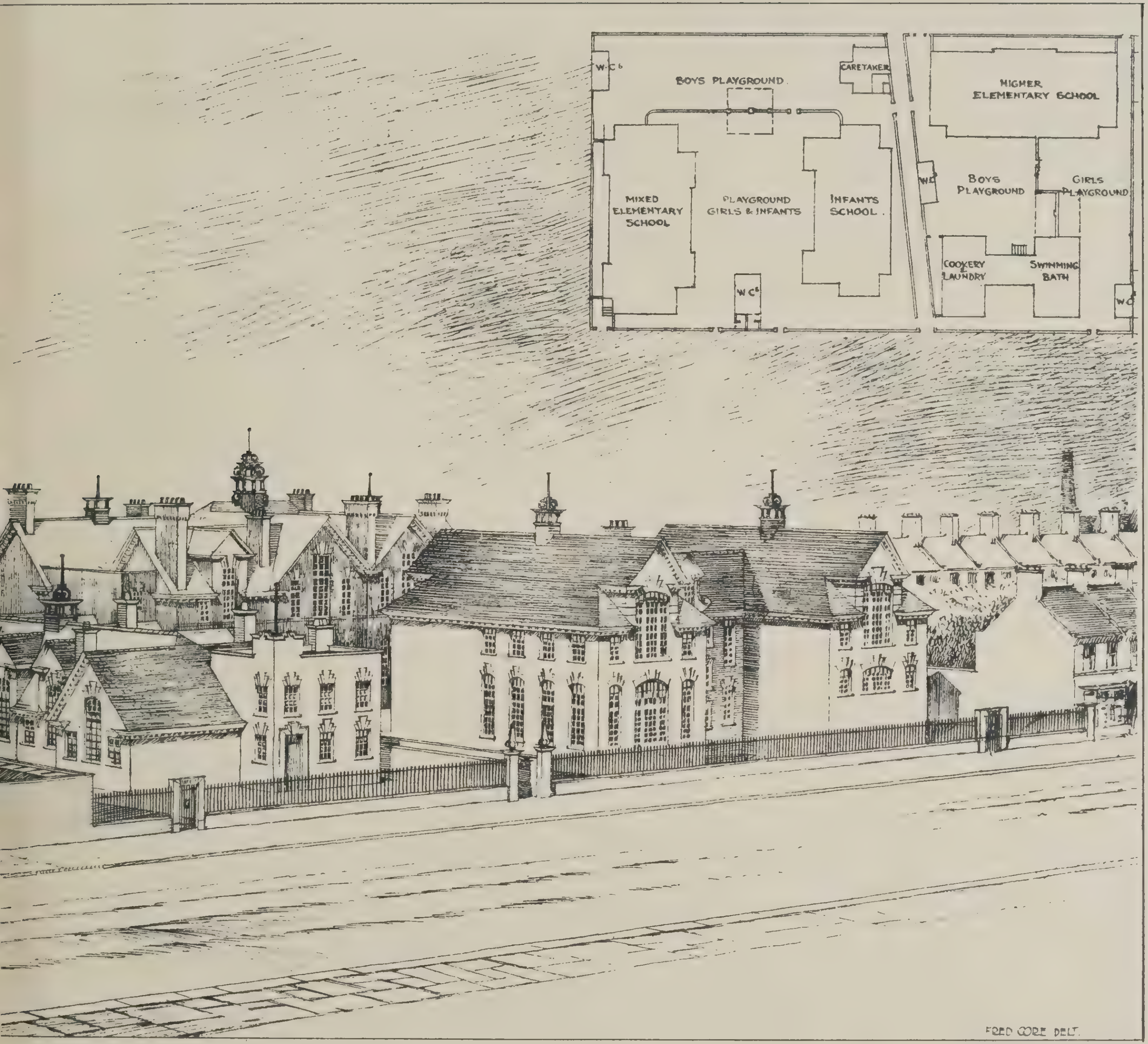
: MATTISON ROAD SCHOOLS :
: FOR THE HORNSEY SCHOOL BOARD :

: ARNOLD MITCHELL ·
· ALFRED BUTLER · } JOINT ARCHITECTS ·





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Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Timber Accounts.

BARNSLEY.—COUNTRYMAN writes: "I have an account rendered for timber in various scantlings and do not understand the reading of the quantities as they are written, thus:—171 lin. ft. of 4ins. by 9ins. is written as 0 1 $1\frac{1}{6}$; 126 lin. ft. of 3ins. by 9ins. is written as 0 0 $17\frac{1}{6}$. I do not understand the parts of the standards. I have consulted various handbooks without result; will you kindly explain?"

Your timber merchant's account is quite in order. The St. Petersburg standard contains 120 "deals," each deal being 6ft. of 3ins. by 11ins. Each standard is divided into "quarters" and "deals," there being four "quarters" in a "standard," thirty "deals" in a "quarter," and six feet to a "deal." So that, in reducing feet lineal to standards, it is first necessary to bring the timber to the standard size of 3ins. by 11ins. (this is done by first multiplying the number of lineal feet by the breadth and thickness of the scantling and then dividing by 3 and by 11), and then to divide by 6 (for deals), 30 (for quarters) and 4 (for standards). The working of your examples is as follows:—

171ft. of 4ins. by 9ins.

Multiply the feet lineal by the breadth and thickness.
4
684
9
6156

Divide by 3 and by 11.
3)
11)12052
187ft. of 3ins. by 11ins. (standard deal).

Divide by 6 to bring ft. to "deals."
6)
$31\frac{1}{6}$

Divide by 30 and bring "deals" to quarters.
30)
1 $1\frac{1}{6}$

Divide by 4 to bring "quarters" to standards.
4)

	Standards.	Quarters.	Deals.
Answer	0	1	$1\frac{1}{6}$

The other example is worked in exactly the same way, but that (for brevity) it is not necessary to first multiply by 3 and then to divide by 3 (there being 3ins. in each scantling). Thus:—

126ft. of 3ins. by 9ins.
9
11)1134
equals $103\frac{1}{11}$ of 3ins. by 11ins.
6)103
$17\frac{1}{6}$ deals.
30)
0 $17\frac{1}{6}$
4)

Standards.	Quarters.	Deals.
0	0	$17\frac{1}{6}$

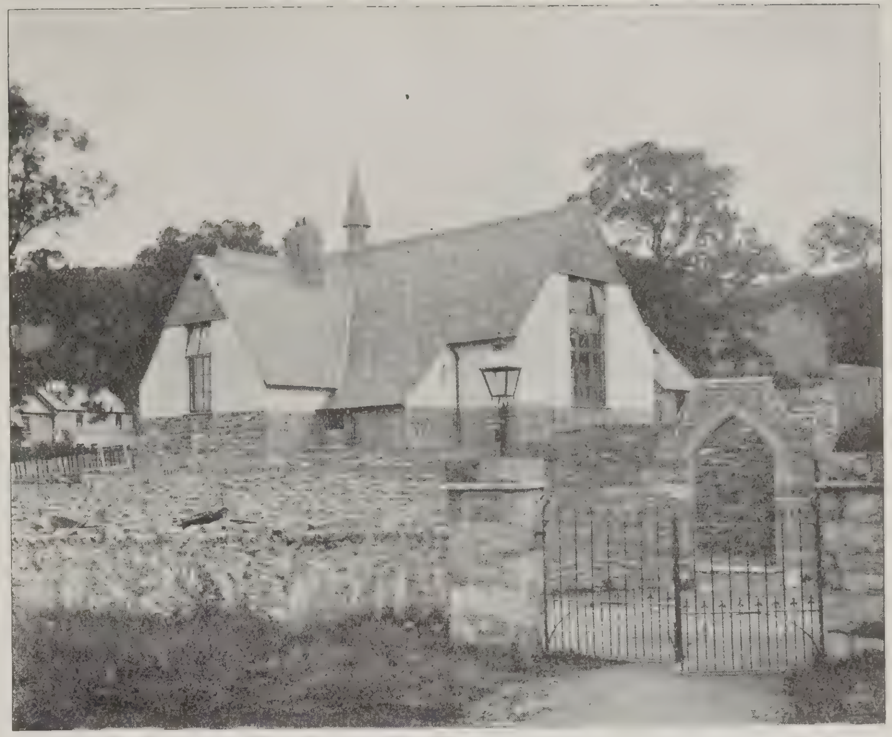
F. S. I.

Stability of Tall Chimney.

BRADFORD.—LOG writes: "Kindly state how to work out the stability of an octagonal chimney, say, 120ft. high."

An octagonal chimney will be worked out on the same principles as the square chimney illustrated and described in THE BUILDERS' JOURNAL for March 4th, 1903. As an octagonal chimney presents less obstruction to the wind than a square chimney, the normal pressure against a plane surface must be reduced by multiplying the vertical diametral plane taken through the angles by the coefficient ·82. The modulus of section of an octagonal chimney will depend upon the size and thickness. The modulus of section z for a hollow octagonal base $= \frac{\sqrt{2}-1}{4} \times \frac{D^4 - d^4}{D}$ where D and d are the outer and inner diameters across the flats.

HENRY ADAMS.



NATIONAL SCHOOL AT GYFFIN, NEAR CONWAY. H. L. NORTH, ARCHITECT.

This school accommodates 100 children and is used as a parish room as well as a school, being one room 48ft. by 18ft. divided by a folding glass screen into schoolroom and classroom. The roofs are of violet and green slates, and the walling is of blue grey local stone covered with cream rough-cast above. The painting is bright green and the chimney of brindled Buckley firebricks. Internally there are a red tile dado and cream walls and ceilings with plain pitch-pine wall-plates and tie-beams; screen doors and cupboards painted dark green. The total cost was £943, including latrines and fencing, &c. The builders were Messrs. W. and E. Williams, of Talybont, and the architect was Mr. H. L. North, B.A., of Conway.

Answers by Post.

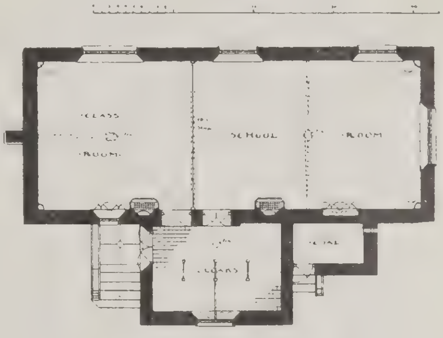
BRIXTON.—QUERIST writes: "Do you answer enquiries by post if a fee is enclosed?"

We cannot undertake to answer enquiries by post, though in special cases we endeavour to oblige our readers with immediate replies. No fee is charged, the only condition being that applicants shall be regular readers.

Repairing Clause in Lease.

ALPHA writes: "A clause in a lease says 'well and sufficiently repair and amend' and deliver up premises 'so well and sufficiently repaired and amended.' (1) At the expiration of the lease, can the lessor claim under this clause internal painting, if in bad order? (2) Can he claim damage for time occupied in doing necessary works after the expiration of the lease, the lessee having omitted to do them? (3) Can the lessor's surveyor's fees be charged against the lessee?"

(1) Yes; the lessor can claim for a reasonable amount of internal painting. There is a certain amount of tendency in favour of the lessee in all such cases however (refer to *Proudfoot* v. *Hart*, 25 Q.B.D. 42). (2) Yes "the landlord may also be awarded some compensation for the loss of the use of the premises while under repair" (see Wright's "Landlord and Tenant," page 198). (3) Yes. By the Conveyancing and Law of Property Act, 1892," 55 & 56 Vict. c. 13, sec. 2, sub-



sec. 1, a lessor "shall be entitled to recover . . . all reasonable costs . . . properly incurred by the lessor in the employment of a solicitor and surveyor or valuer, or otherwise, in reference to any breach," &c., &c. I advise you to procure a copy of the "Handbook on Dilapidations, prepared by the Practice Standing Committee of the Royal Institute of British Architects and issued by the authority of the Council" (published at the Institute, 9 Conduit Street, W., at, I think, 5s.). F. S. I.

Buildings to Measure at Bristol.

BRISTOL.—STUDENT writes: "Please name some buildings in or near Bristol (preferably Renaissance) suitable to measure for the final examination of the R.I.B.A."

As far as can be ascertained in London, there seem to be very few Renaissance buildings in Bristol. St. Peter's Hospital and the Exchange, Bristol; Prior Park, Bath; and Catherine Street Court House, near Bath, would all suit your purpose. Your best course would be to get information from the hon. secretary of the Bristol Society of Architects, Mr. H. Dare Bryan, F.R.I.B.A., 4, Unity Street, College Green, Bristol. M.

Connections to Sewers.

PONTELAND.—J. H. writes: "I am building two houses. Close by is another house. The public sewer is about 100yds. away and in private ground. The adjoining owner and I applied for the sewer to be brought up.

to within a certain distance of the houses. The rural district council has refused, and only passed the plans on the condition that we put in cesspools. There is no difficulty whatever in bringing up the sewer, and I do not suppose it will cost over £30. Can we compel them to bring the sewer up; if so, under what Act?"

This point is dealt with in 37 & 38 Vict. c. 55, s. 23. You cannot compel the council to extend their sewer; and as it is more than 100ft. away from the houses the council cannot compel you to connect with it. But under the same section the council can, as no sewer is available, compel you to put in cesspools to be "of such materials and size, and to be laid at such level, and with such fall as on the report of their surveyor may appear to them to be necessary."

Slating and Tiling.

LANCASTER.—CLERK OF WORKS writes: "Are the following methods considered the best for slating and tiling roofs which are to be plastered on the underside of spars:—Slates: Nail $\frac{7}{8}$in. grooved and tongued sarking on the spars, cover sarking with asphalt roofing felt, and copper nail slates over this without battens or bedding. Tiles: Tiling similarly laid but with tile battens on the felt and the tiles bedded at head in haired mortar. Is there any danger of rot from damp or condensation—especially with tiling, laid as described, where the only ventilation is through the plaster? The advantages appear to be that a warm roof is secured, and there is no inconvenience from the underside pointing coming off or being defective, as almost always the case against walls and hips."

The method proposed for slates is in our opinion inadvisable. In the first place, only $\frac{3}{4}$in. rough boards need be nailed on the spars, and, secondly, it has been found that capillary attraction occurs between the slates, and rainwater is drawn up under them, making a mud with dust that dries slowly because there is no ventilation, on account of the slates being nailed directly on the boards. This mud becomes dried only in seasons of drought, and a roof is thus cold and damp, which encourages the harbouring of germs and fungus and induces rot. A roof is more weather-tight when capillary attraction is avoided by not laying the slates too close. The following would be a good specification: Cover the roofs with $\frac{3}{4}$in. rough deal boarding and lay vertically thereon sarking felt with a 2in. lap, nailed at intervals of 2ins. with clout nails which shall have been dipped while hot in grease or oil; fix battens over felt, and cover with slates to a . . . . in. lap with No. 2 copper nails, ... ins. long, to each slate; the vertical joint to keep a true line from eaves to ridge. As regards tiles, the method proposed is suitable, but there is no reason for bedding the heads in haired mortar.

Copyrighting Plans.

IGNORAMUS writes: "Can plans of houses or any part of them be registered to prevent them being copied? If so, what is the approximate cost?"

A reply to a similar question to yours is given on p. 167 of our issue for October 22nd, 1902. You cannot copyright an original architectural plan, but as a "book" you can copyright (for 5s.) a lithograph of it which has been circulated. Elevations must be registered as "pictures." Full particulars can be obtained from the Registrar, Stationers' Hall, London.

Stable on First Floor.

CARDIFF.—T. A. B. writes: "I am preparing drawings for a stable for horses on the first floor of a building. How can I ascertain the weight per ft. super. that the floor should be constructed to carry? I propose to construct an ordinary iron and concrete floor—cross-girders of about 14ft. span and 10ft. apart, filled in with lighter joists to take concrete filling; the whole floor to be about 55ft. by 14ft. to take eight or nine horses."

Allow for $1\frac{1}{2}$ cwt. per ft. super., with a factor of safety of 10.

Surveyor, Admiralty.

BATH.—S. J. G. writes: "Where can I get particulars of the examination for surveyors to the Admiralty? What is the commencing salary?"

See reply to enquiry on p. 216 of our issue for May 4th, 1904.

On Becoming an F.R.I.B.A.

RAMSBOTTOM. — HAMMER BEAM writes: "How should I proceed to prepare myself for a Fellowship of the R.I.B.A.? I am well versed in building construction and quantity surveying and have a fair knowledge of the sciences."

Of course you can only become an Associate by examination and a Fellow by election. See the regulations in the R.I.B.A. Kalendar, price 2s. 6d. from the secretary, 9, Conduit Street, London, W.

Liability for Damage done by Frost.

LONDON.—T. T. writes: "A contract was given for pointing the fronts of some houses. About a week after they were done a severe frost occurred and some of the pointing fell away. Is the man who did the work liable to make same good?"

Yes, we think so; it clearly proves the pointing was defective or that proper precautions were not taken in view of the season of the year.

Dancing Floor.

COVENTRY.—ENQUIRER writes: "Which is the best form for a spring or chain dancing floor on the ground floor, with basement and partition walls under?"

See our issue for January 26th, 1898, for floors for dancing.

Design of Chimney Stacks.

LONDON.—B. R. writes: "Is there a book on the design and construction of factory chimney stacks? What determines their height and other dimensions?"

See "Boiler and Factory Chimneys," by Robert Wilson, price 3s. 6d. post free from our offices.

"Fumene."

ISLE OF MAN.—MECHANIC writes: "Where can I obtain 'Fumene,' said to be well adapted for colouring light oak?"

Fumene Company, 47, Martin Road, Woodside, South Norwood.

Sanitary Inspectors.

PETERBOROUGH.—H. M. S. writes: "What are the duties of a sanitary inspector? Also, what books and papers are there on the subject?"

See "The Sanitary Inspector's Guide," by Henry Lemmoin-Cannon (price 3s. 6d. post free from our offices).

Signing Form of Contract.

SUBSCRIBER writes: "(1) In executing the R.I.B.A. form of contract (where quantities form part of the contract) is it necessary for the employer to sign the drawings, specification and the bill of quantities, or is it legally sufficient if he signs the form of contract only, the builder signing the form of contract, drawings, specification and bill of quantities? (2) If it is necessary for the drawings, specification and bill of quantities to be signed on behalf of the employer, can the architect do so on the employer's behalf as his agent and without obtaining the employer's written authority to do so?"

(1) It seems only necessary for the builder to sign the drawings, specification and bill of quantities. (2) The architect is both in the position of an agent and a quasi-arbitrator, and the employer is bound by his decisions or orders. He cannot sign the conditions, however.

Bolection Moulding.

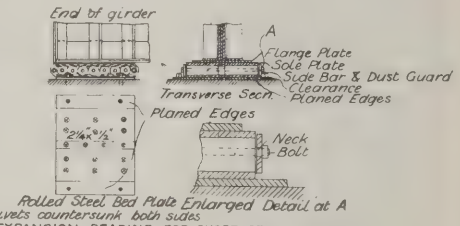
NEWCASTLE-ON-TYNE.—A. R. writes: "The question has arisen in the settlement of an account as to what constitutes a 'bolection moulding.' Is a moulding 'bolection' if it projects beyond the face of the framing, or is it necessarily rebated at the back?"

A bolection moulding is one which projects beyond the plane of the face—that is the definition and nothing more.

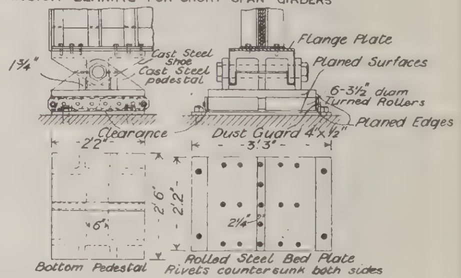
Expansion Bearings for Bridges.

BRADFORD. — LOG writes: "Please give details of expansion rollers for bridges."

Expansion rollers will vary considerably according to the type of bridge span, load, &c. The accompanying sketches are typical, short girders having plain roller bearings and long span girders pivot or rocker bearings over the rollers. At the other end the short girders have a plain flat bearing plate and the long girders a pivot or rocker with flat bed and no rollers. HENRY ADAMS.



EXPANSION BEARING FOR SHORT SPAN GIRDERS



EXPANSION BEARING FOR LONG SPAN GIRDERS

Pumping System.

ARBROATH.—X. writes: "(1) Please state the largest quantity of water that could be pumped with safety through a rising main of 2in. (inside) diameter in gallons per hour to a height of 170ft. What kind of pump should be used driven by an oil engine? (2) Is it workable to have only one pipe as a rising and delivery main? If so, please state the largest quantity of water that could be pumped through a 4in. (inside diameter) pipe to a height of 150ft. and 2,200 yds. long. I require about 25,000 gallons per day to be delivered to the reservoir." (Sketch sent not reproduced.)

Your question is not by any means easy to answer without an inspection. I see your main 4in. cast-iron delivery pipe has been put down twenty years. Therefore it is probably nearly done for, or at any rate badly encrusted, which would, of course, increase the water friction. My reply as to size of pump, &c., must not therefore be considered absolute, but as approximate only, and it is for you to decide whether you will try and utilize the present pipe or put down a fresh one. I do not see any objection to your coupling the 2in. main with the 4in., a stop valve being placed in each pipe to permit them to cut off or used as required. If you have a constant supply of water in the well, and a short suction, I think a triplex vertical single acting 4in. by 4in.

pump should do what you require. This pump when running at 75 revolutions per minute is capable of delivering—under ordinary conditions—40 gallons of water per minute at a cost of about 4-b.h.p. The pump should have a 4in. suction and delivery pipe, and is itself good for a water-pressure of 85 lbs. per sq. in. I assume, however, a total head of 170ft., or, roughly speaking, 75 lbs. per sq. in. Should the pressure exceed this, a greater b.h.p. and possibly a stronger pump would be required. The pump should be fitted with single reduction gear and have as short and straight a suction as may be.

M. POWIS BALE, M.I.C.E.,
Author of "Pumps and Pumping," &c.

Damage done by Adjoining Owner.

CROYDON.—L. G. M. writes: "At the side of my house is a private road leading to a cabyard. The owners of the road instructed their men to dig it up, and have raised the road and thrown it and the water, &c., into my garden and house. The water has soaked under the footings and caused a settlement, and the cabs have broken about 27ft. of my fence. I have written to the owners of the road, but no notice is taken of my requests. What course should I now adopt?"

The owners of the adjoining road have, of course, as little right to throw their drainage water on to your land as they have to damage your fence. I would suggest that, as you are unable to obtain even an acknowledgment of your complaints from your neighbour, you would do well to consult your solicitor before doing anything further. You must not take the law into your own hands, and the legal remedy is by action for an injunction and damages, but probably if proceedings be threatened you will be able to settle the matter without actual recourse to law. F. S. I.

Views and Reviews.

"Academy Architecture."

The two volumes of this well-known publication for 1904 are now before us, furnishing an excellent record not only of the architectural exhibits at last year's Academy but also the sculpture exhibits there, and the chief architectural works at the exhibitions of the Royal Scottish Academy, the Royal Glasgow Institute of the Fine Arts, the Paris Salon, as well as numerous buildings carried out or designed abroad. As usual, the illustrations are excellently printed and include several in effective colour.

"Academy Architecture and Architectural Review, 1904," Vols. 25 and 26. London: Alex. Koch, 58, Theobald's Road, W.C., price 4s. nett. each (paper covers).

Law Reports for Architects.

With architectural practice so set about by legal difficulties, as occur especially in regard to building in cities and towns, we are sure this excellent record of important decisions will be welcomed by the profession. The first requirement of such a compilation must, of course, be thoroughness, and on examining this first issue we find it fully exhibiting that quality. It is not so many reports clipped out and thrown together, but a compilation made with discretion, and the particular points brought out; illustrated, too, with photographs and plans where the case requires, as in *Home and Colonial Stores* v. *Colls*. The publication is proposed to be issued quarterly. It should prove of very great value and convenience to the profession. In this first issue reports of twenty-one important recent cases are given; also the text of the Easement of Light Bill and the proposed amendments to the London Building Act, some legal notes on the latter, as well as on "Landlord and Tenant" and "Light"; and extracts of a legal character from the presidential addresses of Mr. John Belcher and Mr. Guy Dawber. In his preface Mr. Crow draws attention to a new form of index—an accumulating index—which is introduced: this being divided under seven heads, and the cases arranged according to their subject-matter. "It is felt that the success of this work must depend largely on the co-operation of the profession generally, and it is hoped that architects will assist the editor by furnishing particulars of actions in which they may be concerned . . ."

We wish the venture every success. It is well done, and excellently printed.

"The Architects' Law Reports," compiled by Arthur Crow, F.R.I.B.A.; legal editor, A. F. Jenkin, barrister-at-law. Vol. 1. London: 18, Great Prescot Street, E., price 5s. post free

English Furniture.

This history of English furniture, issued in parts—the first two of which are before us—is superbly produced. To begin with, the illustrations are mostly to a large scale and many of them excellently reproduced in colour (after Shirley Slocombe). The work has been divided into four periods, namely, "the age of oak," from 1500 to 1660, comprising furniture that can be attributed to the Renaissance and its evolution from the Gothic; "the age of walnut," from 1660 to 1720, where the change is varied by the Restoration and Dutch influence, followed by a distinctly assertive English spirit; "the age of mahogany," from 1720 to 1770, where the introduction from France of fresh ideas in design marked another change; and "the composite age," from 1770 to 1820, inspired by an affectation for all things classical, combined with a curiously unbalanced taste. At a time when small "handybooks" are rather the vogue, with all their inherent scrappiness and lack of thoroughness, it is refreshing to turn to such a fine treatise as this, with its beautiful reproductions: moreover, the letterpress is inspiriting, being written by an authority and not a hash-up of so much museum information. Considering its quality and size, the price of 7s. 6d. for each part is very moderate.

"A History of English Furniture," by Percy Macquoid. Vol. 1, parts I. and II. London: Lawrence and Bullen, Ltd., 16, Henrietta Street, Covent Garden.

English Metalwork.

This is a volume of drawings—or, rather, indifferent lithographic reproductions of drawings—made by William Twopeny, F.S.A. (1797-1873). They have been unearthed from the British Museum by the editor, who has such an admiration for them that he even says Ruskin's best hardly excelled the pencil workmanship of Twopeny. Well, we have not seen the originals, but judging by these reproductions we certainly accord Ruskin's magnificent drawings a far higher place. The work of both men was essentially careful, but Twopeny's, while being certainly very good, has not the charm of Ruskin's. The quality of a pencil drawing, we admit, is difficult to preserve in a reproduction, but we think that the "pencil half-tone" process is far better than lithography; and though the former is more expensive we think the publishers would have done well to adopt it for this work. As for the examples themselves, they are mostly very fine specimens of ironwork discovered by an enthusiastic antiquary who went up and down the country making a careful record of such work, much of which has since disappeared. Lovers of old English ironwork will therefore find pleasure—and modern designers, maybe, many a useful hint (to put it mildly)—in looking over this book of drawings, though, reverting to our remarks above, we do not think the illustrations themselves will be esteemed for their intrinsic merit, however much that quality may be found in the originals.

"English Metalwork." Ninety-three drawings by William Twopeny, with a preface by Lawrence Binyon and some notes by Lawrence Weaver, F.S.A. London: Archibald Constable & Co., Ltd., 16, James Street, Haymarket, price 15s. nett.

NEW LONDON SEWERS.

Work to Cost £3,000,000.

A plan and report showing the vast extent of the great drainage operations now in progress or about to be commenced in London has been sent to members of the County Council. For years past an average of 12,000 houses has been added annually to the county of London, necessitating a huge expenditure locally on sewers which connect with the great main sewers running parallel north and south of the Thames London, unfortunately, is not blessed with two systems of drainage—one for houses and the other for streets. Thus it comes about that, when there is a heavy fall of rain, the news must be telephoned to the outfalls at Crossness and Barking, so that the moment the flood reaches these points the sludge-gates can be opened and the sewage allowed to pour into the Thames. It is this single-drain system which necessitates the construction of a greater number of sewers.

It is now nine months since a start was made with the first section of the great works which, when completed, will have cost three millions, and will, among other things, have provided a huge tunnel running from the extreme west of London to Barking, doubling the capacity of the great main drain which intersects the Great Eastern Railway at Stratford and passes to the outfall. The Works Department of the Council is at present engaged in building a section of a double tunnel for a new sewer from Old Ford to Barking. The work is divided into three portions, that handed to the Works Department being a mile and a quarter long and estimated to cost £147,280.

Another great work just commenced on the northern side of the river involves the construction of tunnel sewer from Hammersmith to Bow. There is also to be a new low-level sewer from Hyde Park Corner to Stepney, the contract for which is expected to be let about the middle of this year. On the south side of the river trial borings have been made in Plumstead and Catford, through which another tunnel sewer will pass for relieving the floodings in Loampit Vale, Lewisham. Work, too, is about to be commenced for the construction of a new outfall sewer, one section of which, $4\frac{1}{2}$ miles in length, is to cost £348,417. Two new sewers, each but half a mile in length, have been begun. For the West End of London great drains, each about a mile and a half in length, will shortly be undertaken. Their total estimated cost is £795,000. One will run from Cornwall Road, Notting Hill, to Upper Addison Gardens in Kensington. Another will extend from South Street, Wandsworth, to Battersea. These two sewers will cost £72,691. Plans for the new relief sewer from Holloway to the Thames are being prepared.

In addition to these works two pumping stations are to be erected for lifting the sewage from one sewer to another in order that it may gravitate to the outfalls. A new station at Battersea is to be erected at a cost of £7,000, and another at Bermondsey, the cost of the site for which will be £10,000.

When the whole of these works are completed—about four years hence—it is expected that floodings in London will be but memories. The Council will then control over 300 miles of main and flood sewers—excluding, of course, the local sewers in every borough—and a staff of over 1,000 men for dealing with more than a hundred thousand million gallons of sewage annually, as well as a fleet of seven ships which convey 7,000,000 tons of sludge yearly from the Thames to deep sea; and by that time about £7,000,000 will have been spent in the construction and working of the tunnels which convey the sewage out of London.

Current Market Prices.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	14	0	2	0	0
Clover, best	per load	3	15	0	4	2	6
Hay, good	do.	3	10	0	3	15	0
Sainfoin mixture ...	do.	3	10	0	3	17	6
Straw	do.	1	12	0	2	0	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ...	per cwt.	1	0	5	—		
Colza Oil, English ...	do.	1	1	6	—		
Copperas	per ton	2	0	0	—		
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate	per ton	16	0	0	—		
Do. red	do.	15	0	0	—		
Linseed Oil, barrels ...	per cwt.	0	15	0	—		
Petroleum, American ...	per gal.	0	0	$5\frac{1}{2}$	—		
Do. Russian ...	do.	0	0	$4\frac{7}{8}$	—		
Pitch	per barrel	0	8	0	—		
Shellac, orange	per cwt.	9	5	0	—		
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	5	0	1	5	6
Tar, Stockholm	per barrel	1	3	6	—		
Turpentine	per cwt.	1	17	$7\frac{1}{2}$	—		

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ...	per ton	79	0	0	—		
Iron, Staffs., bar ...	do.	5	17	6	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	10	0	—		
Lead, pig, Soft Foreign...	per ton	12	17	6	12	18	9
Do. do. English common brands	do.	13	2	6	13	5	0
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14	0	0	—		
Do. pipe	do.	15	0	0	—		
Nails, cut clasp, 3in. to 6in.	do.	9	5	0	—		
Do. floor brads... ...	do.	9	0	0	—		
Steel, Staffs., Girders and Angles	do.	5	10	0	6	0	0
Do. do. Mild bars ...	do.	6	0	0	6	5	0
Tin, Foreign	do.	134	5	0	134	15	0
Do. English ingots ...	do.	134	10	0	137	0	0
Zinc, sheets, Silesian ...	do.	28	0	0	—		
Do. do. Vielle Montaigne	do.	28	15	0	—		
Do. Spelter	do.	25	0	0	25	10	0

TIMBER.

Soft Woods.

		£	s.	d.	£	s.	d.
Whitewood, American, logs.	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	1	6
Fir, Dantzic and Memel	per load	2	7	6	4	15	0
Pine, Quebec, Yellow ...	do.	4	0	0	7	0	0
Do. Pitch, American...	do.	2	10	0	6	0	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, Uleaborg, Yellow, 4×12	per std.	6	15	0	—		
Do. do. do. 4×10	do.	7	5	0	—		
Do. do. do. 4×9	do.	8	10	0	—		
Do. Archangel, Yellow, 2nd, 4×11	do.	17	5	0	—		
Do. do. do. do. 3×11	do.	15	15	0	—		
Do. do. do. do. 3×9	do.	14	15	0	—		
Do. do. do. 3rd, 4×11	do.	13	0	0	—		
Do. St. Petersburg, White, 1st, 3×11	do.	11	0	0	—		
Do. do. do. do. 3×9	do.	10	0	0	—		
Do. do. do. 2nd, 3×11	do.	9	0	0	—		
Do. do. do. Unsorted, 3×11	do.	8	10	0	—		
Do. do. do. do. $2\frac{1}{2}$×9	do.	8	10	0	—		
Do. do. do. do. $2\frac{1}{2}$×8	do.	8	0	0	—		
Do. do. Yellow, 3rd, $2\frac{1}{2}$×11	do.	8	5	0	—		
Do. do. do. Unsorted, $2\frac{1}{2}$×7	do.	9	0	0	—		
Do. Kristinestad, Yell., Unsorted, $2\frac{1}{2}$×7	do.	8	10	0	—		
Do. West Bay (N.S.), Spruce, 1st, 2nd & 3rd, 3×5	do.	6	0	0	—		
Deals, Amhurst (N.S.), Spruce, Unsorted, 3×9...	per std.	8	0	0	—		
Do. do. do. do. 3×8	do.	7	10	0	—		
Do. do. do. do. 3×7	do.	7	10	0	—		
Do. do. do. do. 3×6	do.	7	0	0	—		
Battens, all kinds ...	do.	5	15	0	9	10	0
Flooring Boards 1in. prepared, 1st... ...	per square	0	8	9	0	9	9
Do. 2nd	do.	0	8	3	0	9	0
Do. 3rd, &c.	do.	0	7	0	0	8	6

Hard Woods.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	4	10	0	7	15	0
Birch, New Brunswick...	do.	2	15	0	6	0	0
Box, Turkey	per ton	8	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	$3\frac{1}{2}$	—		
Do. Honduras ...	do.	0	0	$3\frac{1}{32}$	—		
Do. Tobasco	do.	0	0	$5\frac{7}{32}$	—		
Elm, Quebec	per load	4	5	0	8	15	0
Mahogany, Average Price for Cargo, Honduras...	per ft. sup.	0	0	$5\frac{1}{16}$	—		
Do. African ...	do.	0	0	$3\frac{3}{32}$	—		
Do. St. Domingo	do.	0	0	4	—		
Do. Cuba ...	do.	0	0	$1\frac{15}{16}$	—		
Do. Lagos ...	do.	0	0	$4\frac{1}{8}$	—		
Do. Benin ...	do.	0	0	$2\frac{21}{32}$	—		
Do. Tobasco ...	do.	0	0	$6\frac{5}{32}$	—		
Oak, Wainscot	per log	2	5	0	5	15	0
Do. American quartered, planks and boards	per ft. cu.	0	2	6	0	5	0
Do Dantzic & Stettin	per load	3	0	0	6	10	0
Do. Quebec	do.	5	0	0	8	0	0
Teak, Rangoon, planks...	do.	8	0	0	15	10	0
Do. Indian logs ...	do.	10	0	0	18	10	0
Do. Indian planks ...	do.	13	0	0	20	0	0
Do. Moulmein logs ...	do.	6	10	0	8	0	0
Kaurie pine logs	per ft. cu.	0	1	6	0	2	0
Do. do. planks ...	do.	0	3	0	0	3	6

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending December 30th sixteen failures in the building and timber trades in England and Wales were gazetted.

H. E. CAPSEY, builder, Ilford. Adj. Dec. 17th.

W. J. RICE, builder, Lowestoft. Adj. Dec. 21st.

J. FARRER, builder, Cartmel. R.O. Dec. 19th.

CHILD BROTHERS, builders and contractors, Darlington. R.O. Dec. 17th.

R. J. WEBSTER, contractor, Stratford. R.O. Dec. 22nd.

J. H. BOOTH, painter and decorator, Ilkeston. R.O. Dec. 20th.

D. ROBERTS, builder, Chorlton-cum-Hardy. R.O. Dec. 22nd.

H. B. SMITH, builders' merchant, Ipswich. P.E., Ipswich Shirehall, January 20th, at 10.30.

T. J. HARROP, joiner and contractor, 12, Frederick Street, Rotherham. R.O. Dec. 21st.

C. MOELLER & CO., engineers, Bradford. R.O. Dec. 22nd.

J. DAY, builder, Wolverhampton. Gross liabilities, £1,724; £454 expected to rank for dividend; assets estimated to produce a surplus.

W. E. RICHARDS, builder, Sidmouth. R.O. Dec. 19th. First meeting, O.R.'s, Exeter, Jan. 5th, at 10.30. P.E., The Castle, Exeter, same day, at 11.30.

A. E. PUGH, painter and glazier, Bishops Castle, Salop. First meeting, 4, Corn Square, Leominster, Jan. 12th, at 10. P.E., Leominster Town Hall, same day, at 10.30.

B. HAYNES, builder, West Norwood. First meeting, 24, Railway Approach, London Bridge, Jan. 4th, at 12.30. P.E., Croydon C.C., March 1st, at 11.

Coming Events.

Wednesday, January 4.

BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.—Meeting at 8 p.m.

Friday, January 6.

ARCHITECTURAL ASSOCIATION.—Mr. Alfred Cox on "Libraries," at 7.30 p.m.

Saturday, January 7.

INCORPORATED BRITISH INSTITUTE OF CERTIFIED CARPENTERS.—Meeting at Carpenters' Hall at 6 p.m. Mr. J. D. Manners on "A Visit to Chatham Naval Hospital."

JUNIOR INSTITUTION OF ENGINEERS.—Visit to the Voelker Incandescent Mantle Co.'s Factory, Albert Works, South Street, Wandsworth, at 2.30 p.m.

ARCHITECTURAL ASSOCIATION (Camera and Cycling Club).—Fourth Annual Dinner.

Monday, January 9.

ROYAL PHILOSOPHICAL SOCIETY OF GLASGOW.—Mr. James Duncan Boyd on "The 'Reck' System of Heating," at 8 p.m.

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. John Wilson on "The Palace of Versailles."

Tuesday, January 10.

ARCHITECTURAL ASSOCIATION (Camera and Cycling Club).—Mr. W. M. Dobson on "St. David's Cathedral," at 8 p.m.

INSTITUTION OF CIVIL ENGINEERS.—Sir William Henry White, K.C.B., on "The Recent Visit to the United States and Canada," at 8 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION (Students' Meeting).—Mr. Stanley A. Smith, P.A.S.I., A.R.S.I., on "Quantities," at 7.30 p.m.

CARDIFF, SOUTH WALES AND MONMOUTHSHIRE ARCHITECTS' SOCIETY.—Mr. E. Harding Payne, A.R.I.B.A., on "Public Baths," at 8 p.m.

Wednesday, January 11.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Associates' Meeting, lantern night, at 8 p.m.

Thursday, January 12.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—Annual Dinner, Queen's Hotel, Leeds, at 7 p.m.

Friday, January 13.

GLASGOW TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY. Mr. Joseph Somerville on "Timbers."

INSTITUTION OF CIVIL ENGINEERS (Students' Meeting).—Mr. James Swinburne, M.I.C.E., on "The Theory of Electricity and Magnetism," at 8 p.m.

JUNIOR INSTITUTION OF ENGINEERS.—Prof. Vivian B. Lewes, F.I.C., F.C.S., on "The Theory of the Incandescent Mantle," Westminster Palace Hotel, at 8 p.m.

January 10, 11 and 12.

SURVEYORS' INSTITUTION.—Students' Preliminary Examination.

New Companies.

MANCHESTER BRICK AND BUILDING CO., LTD., 102, Palmerston Street, Ancoats, Manchester. Capital: £5,000.

REDGAR ESTATES CO., LTD. Capital: £50,000.

IMPERIAL STANDARD TIMBER, LTD., to adopt an agreement with T. Hamilton-Adams, and to carry on the business of timber and lumber merchants, &c. Capital: £100,000.

WELSH MACADAM CO., LTD. Capital: £10,750.

Complete List of Contracts Open.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		BUILDING:		
Jan.	5	Carmarthen—Repairs to Schools, &c.	Education Committee	W. D. Jenkins, Shire Hall, Carmarthen.
,,	5	Sheffield—Fittings	——	Gibbs & Flockton, 15 James' Row, Sheffield.
,,	5	St. Bees, Cumberland—Restoration of Farm Buildings ...	——	W. Ireland, St. Bees.
,,	6	London, S.W.—Post-office	Commissioners	J. Wager, Office of Works, Storey's Gate, S.W.
,,	9	London, S.E.—Stables, &c.	Lewisham Borough Council ...	Surveyor, Town Hall, Catford.
,,	9	Hale, Cheshire—School	Education Committee	J. Howarth, Education Offices, Market Street, Altrincham.
,,	9	Walthamstow—Alteration, &c., to School	Education Committee	H. Prosser, Committee's Offices, High Street, Walthamstow
,,	9	Sunderland—New Offices	Water Co.	W. & T. R. Milburn, 20 Fawcett Street, Sunderland.
,,	9	Strathaven—Station-master's House	Caledonian Railway Co.... ...	Engineer to Company, Buchanan Street Station, Glasgow.
,,	9	Rathdrum—Residence and Dispensary	Guardians	G. F. Moore, 1 and 2 Foster Place, College Green, Dublin.
,,	9	Woodbridge—Pavilion	Joint Hospital Board	E. L. Lunn, 36 High Street, Guildford.
,,	9	Barnard Castle—Alterations, &c., to Club, &c.	——	T. Farrow, 7 Market Place, Barnard Castle.
,,	10	Shaldon, Devon—House	Mr. J. Harvey	S. Segar, 24 and 26 Union Street, Newton Abbott.
,,	10	Bedlinog, Wales—Sixteen Houses	Building Club	"Fox and Hounds," Bedlinog.
,,	10	Bundoran, Ireland—Additions, &c., to House	Mrs. Dickson	Tullaghan House, Bundoran.
,,	10	Halifax—House and Photographic Studio	——	M. Hall, 1 Harrison Road, Halifax.
,,	10	Shorncliffe Camp—Post-office	Commissioners	H.M. Office of Works, Storey's Gate, S.W.
,,	10	Aberdare—Additions to School	Urban District Council	J. Morris, Town Hall, Aberdare.
,,	11	Edmonton—Day-room at Workhouse	Guardians	T. E. Knightley, 106 Cannon Street, E.C.
,,	11	London, N.—Cottages	Metropolitan Asylums Board ...	Office of Board, Embankment, E.C.
,,	11	Neston, Cheshire—Alterations to School	Administrative Sub-Committee	H. Beswick, Newgate Street, Chester.
,,	11	Winsford, Cheshire—Alterations to School	Managers of Meadow Bank School.	J. H. Cooke, Council Offices, Russell Street, Winsford.
,,	11	Loughlinstown, Ireland—Nine Cottages	Rathdown No. 2 R.D.C.... ...	P. Cunniam, Clerk, Loughlinstown.
,,	11	Treharris, Wales—School	Merthyr Tydfil U.D.C.	J. L. Smith, 67 High Street, Merthyr Tydfil.
,,	11	Wimbledon—School...	Education Committee	R. H. S. Butterworth, Council Offices, Wimbledon.

Electrical Notes.

Electricity in 1904.

It is perhaps impossible to start a fresh year without summing up to a certain extent the progress or otherwise during the past twelve months. So far as 1904 is concerned, there is not much in the way of progress to relate either in the general advancement of the industry or in regard to new inventions. The former has been much retarded by the adverse financial conditions, which have prevented new enterprises being undertaken and have generally much reduced the amount of business done in every direction. Companies and municipalities have hesitated to commence works which were authorized, or to apply for money on account of those which were not. In consequence manufacturers have not received that large amount of business they have looked for, and, as a result, many men have been thrown out of employment. Amongst the several failures of the year, that of the Sir Hiram Maxim Electrical Engineering Company is the chief, whilst in practically all cases the profits have been so much reduced that the dividends have suffered considerably. Notable cases are the India Rubber, Gutta Percha and Telegraph Works Co., the British Westinghouse Co. and Willans & Robinson. Amongst the few that have held their own, or even improved their positions, are Dick, Kerr & Co. and the Edison & Swan Co. The condition of the former firm is most prosperous, due to its excellent management, whilst this feature in the latter has brought the company once more into the profit-bearing condition. Of new inventions there are few to speak of, partly no doubt owing to the want of money for exploitation purposes. Improvements have been made in electric lamps, as already noted in previous issues, and the single-phase motor is apparently only in its infancy. Perhaps the chief item of interest is the new Raworth system of regenerative control for electric tramways, by which in a simple and well-thought-out manner the motors are made to return current to the line when the cars are going downhill or stopping. A company with a small capital and several important orders has recently been successfully floated, and great things are expected of the invention. The worst period of the depression is generally recognized as having passed, and it is confidently hoped and expected that the new year will see a considerable revival all round and the commencement of many important schemes for traction and power now in abeyance.

An Electric Burglar Annunciator.

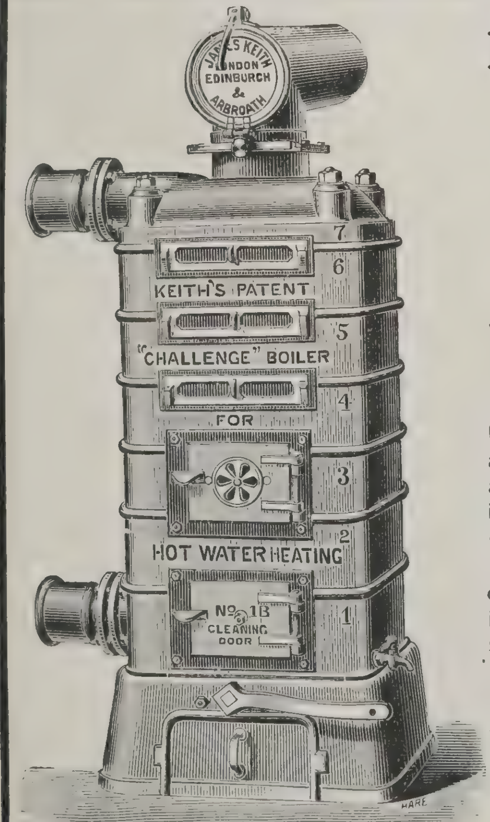
The disadvantage of the electric bell as a burglar alarm is that the burglar if he be up-to-date will be on the look-out for wires, and cut them, or if he hear the bell may have time to make off. The novelty of the above device is that it consists of a police light fixed outside the building and connected to doors, windows or other places likely to be forced or moved in such a manner that it lights up automatically in the event indicated. Being outside the building, its action is unknown to the burglar, whilst it gives the police sufficient time to quietly make their preparations.

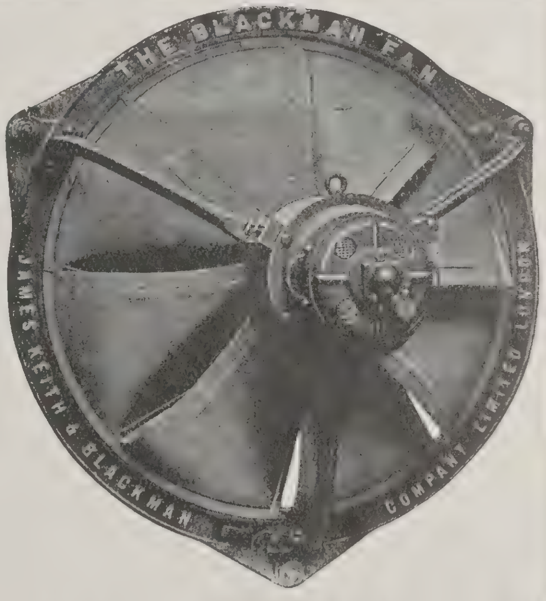
A new Leakage Detector.

A patent has been granted for a novel form of leakage detector which costs very little and indicates at once, either by sight or sound, when and where a leakage occurs. All such devices in use up to the present have necessitated the connection of one pole to earth, so that practically two apparatuses were required, one between each main wire and earth. In the new device the two mains are made to form the circuits of what is practically a differential galvanometer. A magnet or soft-iron float is suspended in the field of two coils wound in opposite directions, and the two mains are broken by these coils. Now it is evident that if there is no leakage current anywhere, the current going through the two coils is equal, and there will be no magnetic effect owing to the differential winding. A leakage on one main or the other will cause the needle to move to one side or the other, and if necessary to ring a bell or give any other signal. Such a device should be of considerable value, and indeed would be useful on all electrical installations.

A.M.I.E.E.

Mr. E. Kilburn Scott, M.Inst.E.E., A.M.Inst.C.E., has been appointed to organize and take charge of the Electrical Engineering Department at Sydney University, with liberty to do consulting work. Mr. Kilburn Scott was originally trained as a mechanical engineer, but for the last fifteen years has held responsible positions in electrical engineering work. Besides his technical knowledge, Mr. Kilburn Scott has had considerable commercial experience with Messrs. Johnson & Phillips, the International Electrical Engineering Co., for whom he was manager for the United Kingdom and the Colonies, as well as an independent consulting engineer. For "Specification" and "The Municipal Engineer's Specification" Mr. Kilburn Scott has contributed a series of articles and specifications on an electric light and power plant for municipalities; a complete electric tramway equipment; electric cranes and elevators; laundry machinery, &c. He was the first to publish a book on electric power in workshops and factories, and for many years has been a constant advocate of alternate current traction. He has recently advised the system for certain railways in North Wales. They will be the first to work with alternating current in this country.

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JAMES KEITH & BLACKMAN COMPANY LIMITED LONDON

KEITH'S Patent
CHALLENGE
BOILERS
FOR HOT WATER
HEATING

Utilise the fuel to the greatest advantage even while working with a rested fire, all the heat being immediately effective independent of the draught of the chimney.

All parts readily accessible for cleaning or examination. Rapid internal circulation. Supplied in sections easy for transport or handling.

In sizes to heat from 500 to 7,000 square feet of surface, also Other Classes of the "KEITH" Boilers.

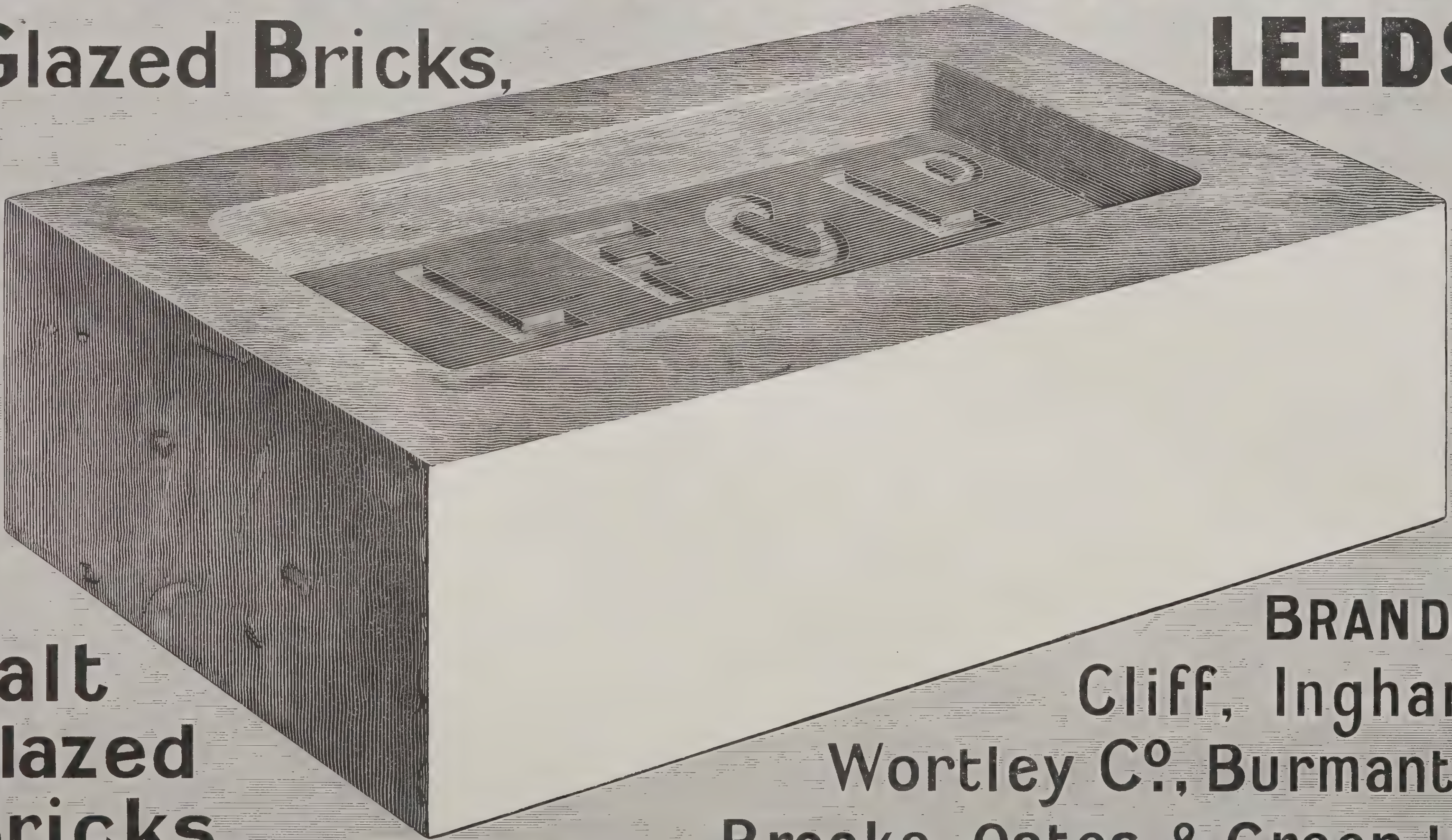
Prices, &c. on Application.

BLACKMAN
ELECTRIC or BELT DRIVEN FANS
for VENTILATING.
Over 65,000 in use.

JAMES KEITH & BLACKMAN Co., Ltd., 27, Farringdon Avenue, LONDON, E.C.
and MANCHESTER, GLASGOW, LEEDS, BIRMINGHAM, & ARBROATH.

THE LEEDS FIRECLAY C^o., L^D., LEEDS.

Glazed Bricks,



Salt Glazed Bricks.

BRANDS:-
Cliff, Ingham,
Wortley C^o., Burmantofts
Brooke, Oates & Green L^td.

Complete List of Contracts Open.—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		BUILDING—*cont*		
Jan.	12	Cork—Forty-six Houses	Town Council	City Engineer's Office, Municipal Buildings, Cork.
,,	12	Kilkenny—Thirty-three Cottages	Rural District Council	Clerk to Council, Kilkenny.
,,	12	Dorchester—Post-office	Commissioners	Post-office, Dorchester.
,,	13	Halifax—Shops, &c.	——	W. C. Williams, 29 Southgate, Halifax.
,,	13	London, W.—Houses	Chiswick U.D.C.	J. Barclay, Town Hall, Chiswick.
,,	14	Lambeth—Municipal Buildings	Corporation	H. J. Smith, Town Hall, Kennington Green, S.E.
,,	16	Bradford—Two Hospitals	Guardians	F. Holland, 11 Parkinson's Chambers, Hustlergate, Bradford.
,,	16	Coventry—Valve House	Gas Committee	F. W. Stevenson, Gasworks, Coventry.
,,	17	Bradford—Enlargement of Offices	Guardians	Empsall & Clarkson, 7 Exchange, Bradford.
,,	18	London, S.W.—Chimney Shaft	Fulham Borough Council	F. Wood, Town Hall, Fulham.
,,	18	Croydon—Cottage, &c.	Rural District Council	R. M. Chart, Union Bank Chambers, Croydon.
,,	19	Billericay—Conversion of Town Hall into Police Station	Joint Committee	F. Whitmore, Duke Street, Chelmsford.
,,	20	Kidderminster—Engine-house, &c.	Corporation	Wilcox & Raikes, Union Chambers, 63 Temple Row, Birmingham.
Feb.	11	Shepton Mallett—School	Education Committee	County Education Secretary, Weston-super-Mare.
,,	28	Preston—School	Corporation	Director of Education, Education Offices, Preston.
		ENGINEERING:		
Jan.	5	West Hartlepool—Boilers	Guardians	Office of Guardians, West Hartlepool.
,,	5	Glasgow—Heating Installation	Corporation	Thomson & Sandilands, 241 West George Street, Glasgow.
,,	5	Carmarthen—Sinking Well, &c.	Education Committee	W. D. Jenkins, Shire Hall, Carmarthen.
,,	6	Scunthorpe, Lincs—Waterworks	Urban District Council	A. McCobban, Horne Street, Scunthorpe.
,,	6	Ventnor, Isle of Wight—Pier Repairs	Urban District Council	E. J. Harvey, Surveyor to Council, Ventnor.
,,	9	Erith, Kent—Tramway Equipment	Urban District Council	C. H. Fry, Clerk, Erith.
,,	10	Newton Abbot—Reservoir	Rural District Council	S. Segar, Union Street, Newton Abbot.
,,	10	Chippenham—Waterworks Extension	Urban District Council	A. E. Adams, High Street, Chippenham.
,,	11	Swansea—Water Main	Rural District Council	T. T. Williams, Council Offices, Alexandra Road, Swansea.
,,	11	Dublin—Extension of Pier, &c.	——	Coastguard Station, Rolroy, Larganreagh, Letterkenny, co. Donegal.
,,	11	Clacton-on-Sea—Meters	Urban District Council	S. Francis, Town Hall, Clacton-on-Sea.
,,	12	Belfast—Boilers	Public Health Committee	Town Clerk, Town Hall, Belfast.
,,	12	Bettws-y-coed, Wales—Waterworks Extension	Urban District Council	Council Offices, Church Hill, Bettws-y-coed.
,,	14	Poole—Quay Wall	Harbour Commissioners	H. F. J. Barnes, Towngate Street, Poole.
,,	16	London, S.E.—Alternator, &c.	Electric Supply Corporation	Kincaid, Waller, Manville & Dawson, 29 Great George Street, S.W.
,,	16	Devonport—Lift	Guardians	H. G. Luff, 64A Chapel Street, Devonport.
,,	16	Port Elizabeth, S.A.—Electricity Supply Works	Corporation	Davis & Soper, Agents to Municipal Corporation, Port Elizabeth, S.A.
,,	18	Ripon—Re-tubing Condensers	Corporation	Gas Manager, Gas Works, Ripon.
,,	23	Epsom—Hot-water Plant, &c.	Asylums Committee	Clerk to Committee, 6 Waterloo Place, S.W.
,,	23	London, S.E.—Footbridge, &c.	Camberwell Borough Council	Town Hall, Camberwell.
,,	24	London, N.—Fire Alarms	Metropolitan Asylums Board	Offices of Board, Embankment, E.C.
,,	28	Giurgevo, Roumania—Electric Light	——	Municipal Offices, Giurgevo.
,,	30	Edinburgh—Gas Exhausters, Engines, &c.	Gas Commissioners	W. R. Herring, New Street Gasworks, Edinburgh.
March	31	Shanghai—Electric Tramways	Municipal Council	J. Poor & Co., 63 Leadenhall Street, E.C.
April	1	Lulea, Sweden—Dredging	——	Harbour Office, Lulea, Sweden.
May	1	Suakin (Red Sea)—Lighthouse	Ports and Lights Administration	Deputy-Controller-General, Ports and Lights Administration, Alexandria, Egypt.
		IRON AND STEEL:		
Jan.	9	Stockport—Rails, &c.	Corporation	John Atkinson, Borough Surveyor, Stockport.
,,	9	Glasgow—Steelwork	Caledonian Railway Co.	Office of Co.'s Divisional Engineer, Princes Station, Edinburgh.
		PAINTING AND PLUMBING:		
Jan.	7	Pontlottyn, Wales—Water Service	Building Club	School House, Pontlottyn.
,,	9	Hamilton, N.B.—Oils, &c.	District Committee	J. B. Ferguson, District Offices, Hamilton.
		ROADS AND CARTAGE:		
Jan.	5	Fleetwood—Road	Urban District Council	E. Frobisher, Town Hall, Fleetwood.
,,	5	Leeds—Paving, &c.	Corporation	City Engineer's Office, Municipal Buildings, Leeds.
,,	6	Brighton—Granite Kerb, &c.	Town Council	Borough Engineer's Office, Maison Dieu House, Dover.
,,	6	Colton, Ulverston—Road	Rural District Council	Engineer, Town Hall, Ulverston.
,,	6	Withington, Manchester—Making-up Roads	Committee of Corporation	Surveyor to Committee, Town Hall, West Didsbury.
,,	7	Harrow-on-the-Hill—Making-up Street	Urban District Council	J. P. Bennett, Engineer to Council, Harrow-on-the-Hill.
,,	9	London, S.E.—Paving	Lewisham Borough Council	Surveyor, Town Hall, Catford.
,,	9	London, S.W.—Granite, &c.	Wandsworth Borough Council	Offices, Council House, Wandsworth.
,,	10	Bromley—Paving, &c.	Council	Borough Engineer, Bromley.
,,	10	Southall—Making-up Roads	Urban District Council	R. Brown, Public Offices, Southall.
,,	10	Ilford—Making-up Lane	Urban District Council	H. Shaw, Town Hall, Ilford.
,,	10	Southall, Middlesex—Street Works	Urban District Council	R. Brown, Public Offices, Southall.
,,	11	London, N.W.—Road, &c.	Metropolitan Asylums Board	Offices of Board, Embankment, E.C.
,,	11	Kingston-on-Thames—Granite	Corporation	Borough Surveyor, Municipal Offices, Kingston-on-Thames.
,,	14	Banbury—Stone	Town Council	N. H. Dawson, Town Hall, Banbury
,,	20	Willesden—Road-making, &c.	District Council	O. C. Robson, Public Offices, Dyne Road, Kilburn.
		SANITARY:		
Jan.	5	Bathgate, N.B.—Sewage Outfall Works	Town Council	P. Campbell Hart, 134 St. Vincent Street, Glasgow.
,,	6	Radstock, Somerset—Sewerage Works	Urban District Council	Balfour & Son, 1 Victoria Street, S.W.
,,	7	Wishaw, N.B.—Sewer	Town Council	W. Rodger, Borough Surveyor, Wishaw.
,,	9	Cardiff—Convenience	Corporation	W. Harper, Borough Engineer, Cardiff.
,,	9	London, S.W.—Conveniences	Wandsworth Borough Council	Offices, Council House, Wandsworth.
,,	9	Wandsworth—Underground Convenience	Borough Council	Surveyor's Office, 41 High Street, Wandsworth.
,,	9	East Moors—Convenience	County Borough of Cardiff	W. Harpur, Borough Engineer, Cardiff.
,,	11	Greystone, Ireland—Sewerage Works	Rathdown R.D.C.	J. H. Ryan, 22 Nassau Street, Dublin.
,,	12	Worksop—Scavenging	Urban District Council	G. H. Featherston, Town Hall, Worksop.
,,	14	Evesham—Sewerage Works	Rural District Council	Barrington & Son, Engineers, Wolverhampton.
,,	16	West Bromwich—Removal of Night-soil, &c.	Corporation	Inspector of Nuisances, Market Hall, West Bromwich.
,,	21	Ludlow—Sewerage Works	Town Council	J. H. Williams, Town Clerk, Ludlow.
,,	21	Yeovil—Sewerage Works	Rural District Council	A. J. Martin, 7 Victoria Street, S.W.
,,	24	Tendring, Essex—Sewage-disposal Works	Guardians	A. J. Martin, 7 Victoria Street, S.W.
,,	28	Sowerby Bridge, Yorks—Sewage-disposal Works	Urban District Council	C. L. Whitehead, Holling's Mill Lane, Sowerby Bridge.
,,	30	Windsor—Sewer	Streets Committee	Borough Surveyor's Office, Windsor.
		TIMBER:		
Jan.	9	Dartford—Timber	Guardians	J. C. Hayward, Union Offices, Dartford.

List of Competitions Open.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Jan.	17	Belfast—Libraries	——	——	Chief Librarian, Public Library, Royal Avenue, Belfast.
,,	30	Swansea—Brick and Flag Plant	——	£1 1s.	Borough Surveyor, 13 Somerset Place, Swansea.
,,	31	Llanelly—Remodelling School Buildings	£20 & £10	——	J. W. Watkins, Education Office, Llanelly.
Feb.	1	Oxford—School	——	£1 1s.	Education Committee, 8 New Road, Oxford.
,,	28	Aylesbury—School	£50 & £25	£1 1s.	C. G. Watkins, Education Offices, Aylesbury.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

Privileges open to all Regular Readers of the "Builders' Journal."

As a Regular Reader of the Builders' Journal you are entitled to the following privileges:—

I.—Free Monthly Advertisements.

1. A Free Advertisement of 12 words in the Wanted or Miscellaneous Advertisement Columns, in one issue of the Builders' Journal during each calendar month will be given to any regular reader.

2. The charge of one penny will be made for each additional word.

3. Advertiser's Name and Address or Box Number must be counted, but will in no case be reckoned as more than five words.

4. All advertisements must be accompanied by the correct remittance, and should a receipt be required a stamped addressed envelope must be enclosed.

5. The Proprietors reserve to themselves the right of refusing any advertisement.

II.—Free Answers to Enquiries.

1. The services of a large staff of experts are at the disposal of all regular readers who require information on architectural, constructional or legal matters.

2. Questions should in all cases be addressed to the Editor, and be written on one side of the paper only.

3. Correspondents are particularly requested to be as brief as possible.

4. The querist's name and address must always be given, not necessarily for publication.

Note.—Owing to the large number of enquiries we receive weekly, we are compelled to restrict the advantages of this department to Regular Readers.

III.—Free Accident Insurance of £500.

1. Every regular reader of the Builders' Journal is entitled to the benefit of this Insurance.

2. Upon receipt of your name and address, an Accident Insurance covering a period of 12 months will be sent free.

3. A Pamphlet giving full details of this and other Insurance schemes inaugurated by the Builders' Journal for the benefit of its readers, and guaranteed by "The Ocean Accident Corporation, Limited," will be sent on application.

What is a Regular Reader?

We have employed the term "Regular Reader" throughout these announcements as the description "subscriber" is often understood to mean one who subscribes direct to the publishing office.

We mean by a Regular Reader anyone who has placed an order with us or any newsagent or bookstall for the Builders' Journal for one year.

Those readers who order the Builders' Journal through their local newsagent or bookstall should send us the newsagent's receipt. Their names will then be placed on our subscribers' list, and they will be entitled to all the advantages set out above.

Advertising Notes.

Advertising is the only force that will carry a business beyond the inertia of "quiet times" and keep it constantly going at its top pace.

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterward, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Monday.

AN ARCHITECT is willing to render assistance in his own office in the preparation of perspectives, designs, working drawings, quantities, &c.—Chas. Carter, M.S.A., Sherwood Lodge, Nottingham. 386

A JUNIOR ASSISTANT requires Situation, good at tracing, inking in, and colouring, 5 years' City experience (age 24), London, West preferred.—Apply G. A. Middleweek, Melbourne Lodge, Melbourne Square, Brixton, S.W. 846

ARCHITECT'S ASSISTANT requires situation; expert in surveying, levelling, details, quantities, &c. Honours Building Construction; has acted as clerk of works; salary. 25s.—Box 848, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S ASSISTANT (A.R.I.B.A.) desires immediate RE-ENGAGEMENT in Provinces. Large varied experience good class Provincial work. Design, details, and experienced Quantity Surveyor. Excellent testimonials. Very moderate salary.—"Experience," Box 847, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S ASSISTANT now disengaged. Excellent testimonials, good draughtsman. Well qualified; artistic. Salary 30s. — Write Box 843, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT and SURVEYOR'S ASSISTANT desires ENGAGEMENT; 10 years' varied experience of all classes of work, including drainage and sewage disposal; excellent references.—Box 825, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S ALL-ROUND COMPETENT JUNIOR ASSISTANT Disengaged; age 22; working drawings, details, survey of buildings, and bills of quantities.—J. J. B., "Inveresk," Thorne Road, Doncaster. 836

ARCHITECT and SURVEYOR'S ASSISTANT (24) Disengaged, nine years' good experience in Lancashire and the North; thoroughly reliable and competent; designs, quantities, details, perspectives; excellent references.—C. W. T., 155, Manchester Road, Burnley, Lancs. 837

ARCHITECT'S ASSISTANT desires SITUATION; good all-round man with good experience; contract drawings, details, surveying assistance with quantities, &c.—Box 840, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT, CIVIL AND MINING ENGINEER'S ASSISTANT (31), desires ENGAGEMENT. Ten years' experience in general practice and office routine.—Box 834, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT desires engagement; 10 years' experience, exceptional qualifications artistic and capable designer and draughtsman, view partnership; details, and usual routine. Moderate salary.—Box 842, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S JUNIOR ASSISTANT desires ENGAGEMENT. Measuring up and plotting. Some knowledge of construction.—Assistant, Bay House, 4a, Heath Street, Hampstead, N.W. 851

BUILDERS AND SPECULATORS can save 25 per cent. by having their Stairs, Joinery, and Carcasing carried out piecework by a reliable man.—Apply Reid, 91, Mill Hill Road, Acton, W. 841

BUILDER'S CLERK (24) disengaged. Thoroughly used to routine, day-work accounts, P.C., &c. Eight years' first-class reference from last employer. Wages 30s.—W. F., 78, Rutland Road, East Ham, E. 820

EXPERIENCED DRAUGHTSMAN desires to render assistance in the evenings on working drawings, details, &c. Terms low.—Box 844, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

FIRST-CLASS CARPENTER & JOINER, experienced in staircases and shopfitting, and every description of joinery, desires SITUATION.—Apply to C. W. Fletcher, 115, Clifford Gardens, Kensal Rise, N.W. 821

GENERAL WORKING FOREMAN BRICKLAYER, good manager, draughtsman, and timekeeper; well up in plans and detail; permanency preferred in London district; good references; age 32—W., 80, Selwyn Avenue, Highams Park, N.E. 838

JOINER (26) desires change. Used to first-class work. Would take up £50 share in good shop.—Apply A. S., 2, St. John's Terrace, Gosbrook Road, Lower Caversham, Reading. 822

QUANTITY SURVEYORS. — Assistant wants taking off, &c, or open to accept engagement as Assistant Surveyor. Excellent testimonials, Box 845, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

STAIRCASE HAND and HANDRAILER seeks EMPLOYMENT; well up in plans and specification work; good setter out.—Box 839, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

WORKING ELECTRICIAN wants to undertake any kind of electrical work for builders, by contract or day work, with or without supplying materials. Repairs attended to at any time.—Box 827, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

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CLERK WANTED for CORRESPONDENCE and LEDGER WORK; N.W. district; shorthand and typewriting; state age, qualifications, and salary required, to Box 830, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

WANTED, JUNIOR ASSISTANT in Drawing Office. Preference given to Builder's Office experience. Must have thorough knowledge of Plans and Quantities, and be a quick Draughtsman.—Apply, stating age, wages asked, references, and full particulars, to Thomas Walker & Co., Limited, Saw Mills and Joinery Works, West Hartlepool.

WORKING PARTNER WANTED at once to a Builder and Contractor. About £1,500 required to pay out retiring sleeping partner for stock, machinery, plant and goodwill. Every investigation. Must be well experienced in the trade, and highly respectable.—Apply Box 832 Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

Drawings, Tracings &c.

PERSPECTIVES, ink, wash, or colour; also assistance in design, details, and competition work.—Apply Box 849, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

Offices &c. Wanted & To Let.

TO ARCHITECTS.—Well lighted OFFICE TO LET in modern building. Rent, including telephone and electric light, £24. Arrangements could be made for joint use of clerk's office if required.—Apply Housekeeper, 25, Bedford Row, W.C.

EMPLOYMENT REGISTER.

Too late for Classification.

836.—Architect's Junior Assistant (22). Competent wkg. drawings, details, surveys, and quantities.

837.—Architect and Surveyor's Assistant (24) 9 yrs. exp. in the North. Design, quantities, details and perspectives.

838.—General Working Foreman, 32, bricklayer draughtsman and timekeeper. Plans, details London preferred, good refs.

839.—Staircase Hand and Handrailer. Plans and specification work. Good setter out.

840.—Architect's Assistant, good all-round exp Details, contract drawings, surveying and quantities.

841.—Stairs, Joinery, Carcasing carried out by reliable man. Piecework.

842.—Architect, 10 yrs. exp., artistic designer and draughtsman, details, mod. s. View to partnership.

843.—Architect's Assistant, good draughtsman fully qualified, artistic, sal. 30s, ex. refs.

844.—Experienced Draughtsman renders assistance in evening with wkg. drawings, details &c. Terms mod.

845.—Quantity Surveyor's Assistant, ex. refs.

846.—Junior Assistant (24). Tracing, inking in and colouring, 5 yrs City exp. West London pre

847.—Architect's Assistant, A.R.I.B.A. Wide exp. in provincial work. Design, details quantities, ex. refs., mod. s.

848.—Architect's Assistant, surveys, levelling details, quantities. Honours Building Construction. Clerk of Works, sal. 25s.

849.—Perspectives, ink, wash or colour, and assistance with designs and competition work.

851.—Architect's Junior Assistant, measuring up plotting, and knowledge of construction.

See p. xx for the Employment Register.

SEE PAGE XX FOR EMPLOYMENT REGISTER.

WORKING or COMPETITION DRAWINGS, PERSPECTIVES, TRACINGS,
PHOTO-COPIES, All kinds of copies, including PERMANENT BLACK LINE on CARTRIDGE or LINEN. **MODELS** OF BUILDINGS, WORKS, ETC., **LITHO-PRINTING.**
THE LONDON DRAWING & TRACING OFFICE, (Estd. 1883.) **98, Gray's Inn Road, W.C.** (Adjoining Holborn Town Hall.)
Telephone, No. 1011 HOLBORN. *Manager*—**JOHN B. THORP.** Telegrams: "DIVIDITORE," LONDON.

Educational.

ALL TECHNICAL EXAMINATIONS.—First place in every open competition during last two years. Correspondence or Resident Tuition. Vacancy for Articled Pupil.—G. A. T. MIDDLETON, 19, Craven Street, W.C.

R.I.B.A. EXAMS.—Personal and Correspondence tuition; courses of any duration. Apply for syllabus to Mr. A. G. BOND, B.A. Oxon., A.R.I.B.A., 115, Gower Street, London. W.C. (late Howgate and Bond).

QUANTITIES.—A course of Correspondence Lectures in this subject (on the London system) is now ready. Also Lectures in Estimating. For particulars apply Box 632, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

SURVEYORS' INSTITUTION EXAMINATIONS.—CANDIDATES for the forthcoming Quantity and Building Surveyor Examinations, Professional Associate and Fellowship, assisted by Surveyor. Correspondence or individual tuition. Terms moderate. —F.S.I., Box 850, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

STRUCTURAL STEELWORK

Correspondence Classes specially for Architects, Assistants, Surveyors, Builders, and Draughtsmen, are held by the MIDLAND ENGINEERING BUREAU, STRAND, DERBY. Booklet J. thoroughly describes them. Science tuition also in Practical Mathematics, Applied Mechanics, &c. All information free on request.

THE ARCHITECTURAL ASSOCIATION.

January 6th, 1905. Ordinary General Meeting at No. 18, Tufton Street, Westminster, S.W., at 7.30 p.m. Paper by Mr. ALFRED COX on "Libraries."

LOUIS AMBLER
HENRY TANNER, Jr. } Hon. Secs.

KING'S COLLEGE, LONDON.

TRAINING FOR SANITARY INSPECTORS.

The Course of Systematic Instruction in Building Construction, the General Duties of Sanitary Inspectors, and Chemistry and Physics in relation to Sanitary Science, commences TUESDAY, January 10th.

Apply to the SECRETARY,
King's College.

KING'S COLLEGE, LONDON.

The Classes in WOOD CARVING for Ladies and Gentlemen, established by the Worshipful Company of Carpenters, will RE-OPEN on January 16th.

The Day Classes are held on Monday and Wednesday, from 11 to 5; and Evening Classes, on Monday, Wednesday, and Friday, from 7 to 9.

The Fees have recently been reduced.

For full particulars apply to the SECRETARY, King's College; or the Clerk, Carpenters' Hall, London Wall, E.C.

WORSHIPFUL COMPANY OF CARPENTERS.

EVENING CLASSES and LECTURES in BUILDING CONSTRUCTION, DRAWING, and QUANTITIES, and the HISTORY OF ARCHITECTURE; also the ARCHITECTURAL STUDIO at KING'S COLLEGE, LONDON, will commence MONDAY, JANUARY 16th. For full particulars apply to the SECRETARY; or to J. HUTTON FREEMAN, Esq., Carpenters' Hall, London Wall, E.C.

Competitions Open.

PROPOSED NORTHUMBERLAND WAR MEMORIAL.

The Committee appointed to carry out the above are prepared to receive SKETCH-MODELS, PLANS, etc., by sculptors and others desirous of competing for the work.

The Corporation of Newcastle-upon-Tyne have provisionally agreed to give a site for the Memorial, occupying one of the most conspicuous positions in the City, and a substantial sum will be expended on the erection.

Further particulars may be obtained on application to Mr. CHARLES COWELL, Pearl Buildings, Northumberland Street, Newcastle-on-Tyne.

Miscellaneous.

LIFTS.—WM. AUG.'S GIBSON, LTD., formerly President of American Elevator Co., later Managing Director Otis Elevator Co., Ltd. Temple Bar House, 28, Fleet Street, London, E.C.

MARBLE, GRANITE, STONEWORK. Supplied to Architects and Builders. Send for Builders' Price List and Quotations. Telephone 1159, Hampstead.—KELLY & Co., Kilburn, Mill Hill, N.W., etc.

ODD R.I.B.A. JOURNALS WANTED.—Send particulars to Box 835, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

TO FLAT AND VILLA BUILDERS.—Special cheap line in internal fire resisting partitions; room saving and sound proof.—Address, PARTITIONS, 60, Watling Street, London, E.C.

POLING BOARDS, selected lengths and thicknesses (best quality and full measure).

Also Scaffold Boards, Putlogs, Scantlings, Deals, Battens, and Boards. Lowest wharf prices.

C. H. GLOVER & Co., Ltd., Importers, Hatcham Saw Mills, Old Kent Road, S.E.

YOUNG ARCHITECT has well-furnished ROOMS (with board, &c.) to offer on reasonable terms to one or two (not more) professional men. Piano, bath-room, bicycle storage.—Apply 51, Oxberry Avenue, Putney Bridge, Fulham, S.W.

Contracts Open.

GUILDFORD, GODALMING & WOKING JOINT HOSPITAL BOARD.
TO BUILDERS AND CONTRACTORS.

TENDERS are invited for the Work required in the erection of a New Pavilion for Scarlet Fever and in carrying out small additions to the Administration Block and the block of Outbuildings at the Isolation Hospital, Woodbridge, near Guildford.

Persons willing to tender are asked to send their names to Mr. EDWARD L. LUNN, Architect, 36, High Street, Guildford, not later than MONDAY, the 9th of January 1905.

The Drawings, Specification and Conditions of Contract may be seen on application to the Architect as above, and copies of the Bills of Quantities and Form of Tender will be supplied by him on payment of the sum of Five Guineas, which will be returned to those who send in a bonâ fide Tender.

The Tenders will have to be delivered to me at the time and place named on the Bills of Quantities, but the Joint Hospital Board does not bind itself to accept the lowest or any of them.

W. S. V. CULLERNE,
Clerk to the said Board.

Commercial Road, Guildford,
December 20th, 1904.

URBAN DISTRICT OF BANGOR,
COUNTY DOWN
TO IRONFOUNDERS.
CAST-IRON GAS MAINS.

The Urban District Council of Bangor, County Down, invite TENDERS for the Supply of about—

330 Yards of 5-inch Cast-Iron Gas Mains.
1,200 do. 4-inch do. do.
520 do. 3-inch do. do.

together with special Castings, Bends, &c.

Specification and Form of Tender, prepared by Mr. Ernest L. Woods, C.E., Town Surveyor, may be obtained at my Office, on payment of £1, which will be returned on the receipt of a bonâ-fide Tender.

Sealed Tenders, endorsed "Cast-Iron Gas Mains," will be received by me up till Twelve o'clock Noon, on TUESDAY, the 17th day of January, 1905.

The Council do not bind themselves to accept the lowest or any Tender.

JAMES MILLIKEN,
Clerk to the Council.

Town Hall, Bangor, County Down,
29th December, 1904.

URBAN DISTRICT OF BANGOR,
COUNTY DOWN.
TO IRONFOUNDERS.
CAST-IRON WATER MAINS.

The Urban District Council of Bangor, County Down, invite TENDERS for the Supply of about—

1,302 yards of 5-inch Water Main.
1,437 do. 4-inch do.
102 do. 3-inch do.

together with special Castings, Bends, &c.

Specification and Form of Tender, prepared by Mr. Ernest L. Woods, C.E., Town Surveyor, may be obtained at my Office, on payment of £1, which will be returned on the receipt of a bonâ-fide Tender.

Sealed Tenders, endorsed "Cast-Iron Water Mains," will be received by me up till Twelve o'clock Noon, on TUESDAY, the 17th day of January, 1905.

The Council do not bind themselves to accept the lowest or any Tender.

JAMES MILLIKEN,
Clerk to the Council.

Town Hall, Bangor, County Down,
29th December, 1904.

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	s.	d.
Four lines or under (about 30 words)	1	6
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To Contributors.

THE EDITOR will be pleased to consider any articles, illustrated or otherwise, dealing with old and new buildings, methods of construction, or other matter of an architectural character. He will also be glad to consider architectural photographs and sketches (the latter preferably in black and white) and measured drawings of work in this country or abroad. News items of interest to architects and builders will also be considered, provided the name and address of the sender are given; no notice will be taken of anonymous contributions. All communications should be addressed to the Editor of THE BUILDERS' JOURNAL, 6, Great New Street, E.C.

5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS.
OFFICE: 6, GREAT NEW STREET, FETTER LANE, E.C.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Bristol.—For an extension to Messrs. T. Adams & Brothers' warehouse at Lawrence Hill. Mr. W. H. Watkins, architect, 15, Clare Street, Bristol:—

W. Cowlin & Son	£2,050
C. A. Hayes	1,997
T. R. Lewis	1,950
R. F. Ridd	1,939
E. Love	1,900
A. J. Beaven	1,899
G. Humphreys	1,890
H. W. & E. J. Neale*	1,860

* Accepted.

Chadwell Heath (Essex).—For the erection of a shop and private house. Mr. Herbert Riches, architect, 3, Crooked Lane, King William Street, London, E.C.:—

Sheffield Brothers	£1,295	0	0
Osborn & Sons	1,149	0	0
F. & A. Willmott	1,099	0	0
Dowsing & Davis	1,090	0	0
Clemens Brothers*	1,050	10	0

* Accepted.

Great Missenden.—For the erection of two houses, for Mr. Alfred Dunhill. Mr. J. Bruce Merson, architect, 6, High Road, Kilburn, N.W.:—

Patman & Fotheringham	£2,223	0	0
M. Dymock	2,179	16	0
Aldridge & Son	2,165	1	0
H. J. Wright	2,102	5	0
G. Parsons*	1,846	0	0

* Accepted.

Horley (Surrey).—For the erection of a new Council school, for the Surrey Education Committee. Messrs. Jarvis & Richards, architects, 36, Victoria Street, S.W.:—

Strange & Sons, Tunbridge Wells	£4,400	0	0
Longley & Co., Crawley	4,389	0	0
R. B. Amos, Redhill	4,337	2	5
Thomas & Edge, Woolwich	4,316	0	0
Crosby & Co., Farnham	4,299	0	0
Denne & Sons, Deal	4,272	0	0
Buckland & Waters, Redhill	4,261	0	0
S. Knight, Cuckfield	4,261	0	0
J. J. Pink, Merstham	4,246	0	0
J. & M. Patrick, Wandsworth	4,178	0	0
R. Cook & Sons, Crawley	4,137	0	0
I. Waters & Sons, Forest Row	4,134	0	0
Davey & Jones, Westcliff-on-Sea	4,123	0	0
E. C. Hughes, Wokingham	4,105	0	0
Foster Brothers, Norwood Junction	4,090	0	0
S. Page & Sons, Croydon	4,078	0	0
R. Dean & Co., Croydon	4,062	0	0
J. Parsons, Waterloo Road	4,014	0	0
J. G. Pickard, Turner's Hill	3,944	16	0
H. Kent, Lewisham	3,890	0	0
P. J. Webb,* Godstone, Surrey	3,886	16	0

NOTE.—Twenty-five other builders sent in tenders.

Keady (Ireland).—For the erection of new premises at Keady, co. Armagh, for the Northern Banking Co., Ltd. Mr. H. C. Parkinson, architect, Armagh. Quantities by Messrs. W. H. Stephens & Sons, Donegall Square North, Belfast:—

McRoberts & Armstrong	£5,140
J. Kidd	5,140
Courtney & Co.	5,100
H. Laverty & Sons	5,000
R. Calwell	4,900
W. Dowling*	4,670

* Accepted. [All of Belfast.]

Kirkby-in-Ashfield.—Provisionally accepted for the construction of new gasworks, for the Kirkby-in-Ashfield U.D.C.:—

R. Dempster & Sons, Ltd., Elland, Yorks	£13,849	10

Littlehampton.—For the erection of a free library, for the U.D.C. Mr. H. Howard, M.S.A., architect. Quantities by Mr. C. F. A. Poland, 6, John Street, W.C.:—

A. Burrell	£2,699
Linfield & Sons	2,337
Snewin Brothers	2,319
W. Wallis*	2,197

* Accepted.

[Architect's estimate, £2,250.] [All of Littlehampton.]

London, S.W.—For proposed new sorting-rooms and offices at the Anglo-American Laundry, Lower Tooting, for Mr. D. Wynter. Plans by Mr. S. J. Reynolds, Reigate. Quantities by Mr. J. Kennard, Croydon:—

Josolyne & Young	£1,875
A. Black & Son	1,500
Truett & Steel	1,460
A. Funnell & Co.	1,459
W. Smith & Sons	1,432
W. Akers & Co.,* South Norwood	1,375
D. D. Barker	1,318

* Accepted.

London.—For rebuilding 30 and 32, Whitfield Street, for Messrs. Catesby & Sons. Mr. H. A. Whitburn, M.S.A., architect, 22, Surrey Street, W.C., and Woking. Quantities by Mr. J. T. Carew, surveyor, 22, Surrey Street:—

		A.
H. Burman & Sons	£5,481	£97
J. Carmichael	5,430	50
D. Prosser	5,397	—
Mattock & Parsons	5,289	30
Patman & Fotheringham	5,153	120
Smith & Sons	5,015	30
Martin-Wells	4,975	—
H. M. Dove	4,970	—
Mattock Brothers	4,909	—
T. Sobey, 34, Lamb's Conduit St.	4,934	50

A. Credit for old materials.

(*Continued on p.* xviii.)

THE BUILDERS' JOURNAL SUPPLY DEPARTMENT.

We have been able to make satisfactory arrangements with the best Manufacturers of Drawing Office Requisites, and we propose to publish from time to time illustrated lists of the articles supplied with prices, &c., as follows:—

- No. 1 List. Sets of Mathematical Instruments.
- No. 2 List. Various Scales and Philotechnic Set.
- No. 3 List. Drawing Boards, T Squares and Set Squares.
- No. 4 List. Drawing and Tracing Paper, Tracing Cloth, &
- No. 5 List. Inks, Water Colours, Paints, Brushes, &c.

LIST No. 3.

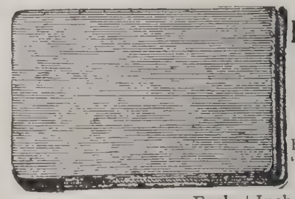
English Shaped T-Squares.

BEST MAHOGANY POLISHED T-SQUARES,

Extra Finish, Ebony Edged, Pegged and Keyed.

No. 140.

Length, 12 in.	taper blade,	**1/6** each.
" 18 in.	"	**2/6** "
" 24 in.	"	**3/-** "
" 31 in.	"	**3/6** "
" 36 in.	"	**4/6** "
" 42 in.	"	**5/6** "
" 48 in.	"	**6/-** "
" 54 in.	"	**8/-** "



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Each Board is stamp "E. & S. Triplex, 15

Inches.		Each.
13×9½	Imperial 4to	**1/-**
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19×13½	Half Imperial	**1/9**
20×15½	Medium	**2/-**
23×16	Half Imperial (full size)	**2/3**

Inches.		Ea
22×17	Royal	**2/**
24×19	Half Double Elephant	**3**
28×19	Imperial	**3/**
30×22	(Special)	**4/**
31×23	Imperial (full size)	**5,**

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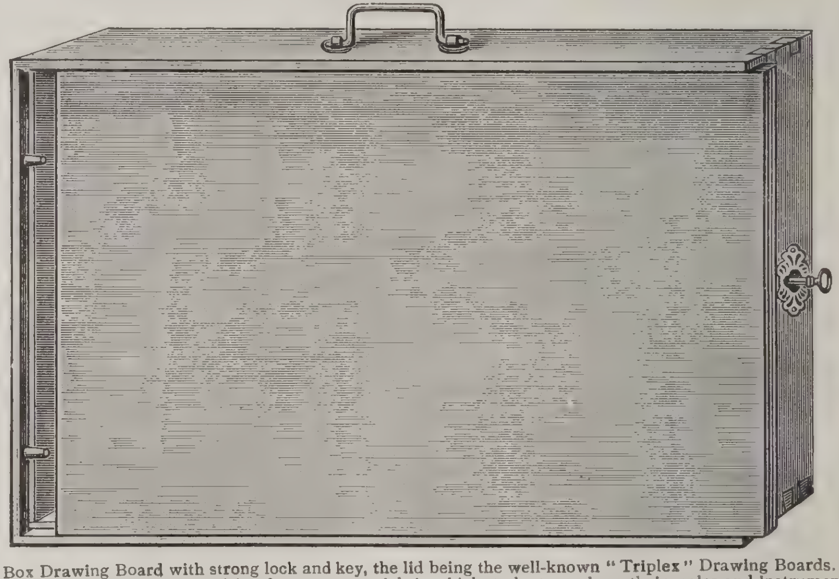
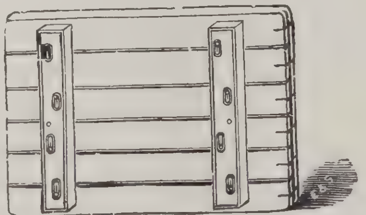


Outside Measurements—23⅜″ × 16¾″ × 2½″

Box Drawing Board with strong lock and key, the lid being the well-known "Triplex" Drawing Boards. Size 23×16 in. This is a most useful and necessary article in which students can keep their scales and instruments,

ENGINEERS' & ARCHITECTS' DRAWING BOARDS.

No. 144.



These Boards are made from best seasoned pine, grooved with mahogany battens, brass slots and screws to allow of contraction. One edge inlaid with ebony.

23×16 in., Royal	**7/-**
28×21 in., Imperial	**9/6**
32×23 in., Imperial (full)	**12/6**
42×29 in., Double Elephant	**16/-**
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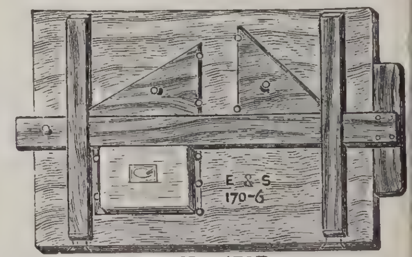

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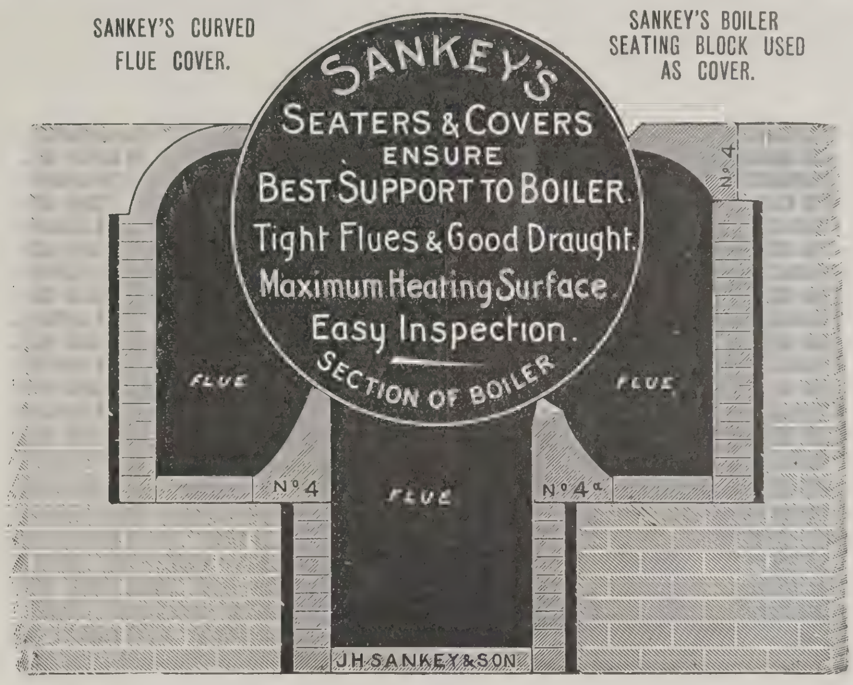

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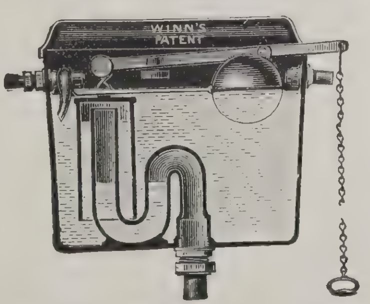

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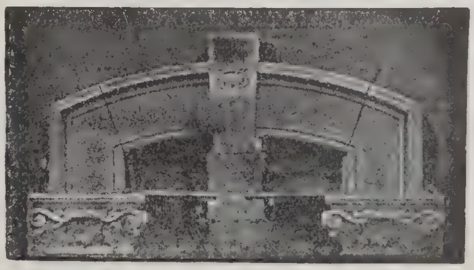

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TENDERS – *cont. from p.* xvi.

London, N.E.—Accepted for repairs and decorations to five shops at Lower Clapton. Mr. Herbert Riches, architect, 3, Crooked Lane, King William Street, London, E.C. :—

J. T. Robey	£828

London, N.E.—Accepted for repairs and decorations to two shops at Lower Clapton. Mr. Herbert Riches, architect, 3, Crooked Lane, King William Street, London, E.C. :—

A. W. Derby	£151

London, E.—For the execution of certain works in connection with the building of a nurses' home at the infirmary, Bancroft Road, Mile End Road, for the Guardians of Mile End Old Town. Mr. J. M. Knight, architect, 53, Bancroft Road :—

E. Jackson, Stepney	£8,959
F. & F. J. Woods, Mile End	8,773
J. Gibbs, 229, Cable Street, E.	8,765
Perry & Co., Bow	8,199
Turnbull & Sons, Northumberland Alley	8,050
W. Johnson & Co., Wandsworth Common	7,995
Harris & Wardrop, Limehouse	7,859
W. Yates, Bow	7,787
J. Calcutt, Mile End	7,687
A. Symes, Stratford	7,619
W. A. Barker,* Forest Gate	7,536
T. Almond & Son, Ponders End	7,400
W. Gladding, Whitechapel Road	7,398
E. Lawrence & Son, City Road	7,395
T. Pearce, Thornton Heath	7,276

* Accepted.

London, S.E.—For the erection of a branch library at Brockley, for the Libraries Committee of the Lewisham Borough Council. Mr. A. L. Guy, architect, 4, Verulam Buildings, Gray's Inn, W.C. Quantities by Mr. H. Raven, 35, Southampton Street, Strand :—

F. H. Eley (Mordey & Meyer)	£5,791	0	0
W. & D. Wilkins	5,367	0	0
R. L. Tongue & Co.	5,318	0	0
A. W. Robins	5,214	0	0
A. W. Jaggers & Co.	5,178	15	1
Stannes & Son	5,073	0	0
H. Leney & Son	4,940	0	0
Thomas & Edge	4,905	0	0
J. Watt	4,850	0	0
A. F. Vigor & Co.	4,838	0	0
Bulled & Co.	4,817	0	0
Aldridge & Son	4,800	0	0
J. Smith & Son	4,740	0	0
Cropley Brothers	4,736	0	0
G. Wales & Co.	4,726	0	0
W. Martin	4,699	0	0
H. L. Holloway	4,667	0	0
Hibberd Brothers	4,654	0	0
H. Kent	4,644	0	0
W. Smith & Sons	4,623	0	0
Stimpson & Co.	4,619	0	0
R. T. Hughes & Co.	4,605	0	0
T. Pearce	4,600	0	0
R. A. Dean & Co.	4,587	0	0
Davey & Jones	4,568	0	0
B. E. Nightingale	4,535	0	0
Patman & Fotheringham	4,527	0	0
T. G. Sharpington	4,525	0	0
Shelbourne & Co.	4,508	0	0
J. A. Renwick	4,494	0	0
Foster Brothers	4,433	0	0
Perry Brothers	4,347	0	0
Bragg & Sons	4,144	0	0
F. J. Gorham,* Greenwich	3,955	6	0

* Accepted.

Plymouth.—For the erection of two blocks of dwellings at Prince Rock, for the Plymouth Corporation. Messrs. Hine & Odgers, architects, Lockyer Street, Plymouth :—

W. T. Flashman	£5,850
J. Paynter	5,750
W. E. Bennett, Plymouth	5,501
A. N. Coles	5,010
T. Stanbury, Devonport	4,896
A. R. Lethbridge & Son	£4,885
A. Andrews	4,880
W. T. Stevenson	4,870
Roach & Lovell	4,863
A. C. Jones	4,746
Matcham & Co.	4,726
J. Crockerell, Devonport	4,725
T. May	4,643
Pearse Brothers	4,549
W. E. Blake	4,450
S. Roberts*	4,399

* Accepted. Reduced by some omitted work to £4,250.

[Rest of Plymouth.]

Southend-on-Sea.—For works in connection with the making-up of a roadway in continuation of Occupation Road, with the necessary retaining walls, arches, &c., for the Corporation. Mr. E. J. Elford, borough engineer :—

G. Bell, Tottenham Hale	£4,942	11	6
W. Iles, Southend	4,250	0	0
Buxton & Jenner, Southend	4,145	12	7
J. C. Flaxman, Southend*	3,9[illegible]0	0	0

* Accepted.

[Surveyor's estimate, £4,200.]

Wokingham (Berks).—For the erection of new schools at Wokingham, for the Berkshire Education Committee. Mr. F. C. Pinks, architect, Parliament Mansions, Victoria Street, S.W. :—

H. W. Godwin	£7,417	9	10
S. Orchard & Son	7,337	0	0
J. Ferguson & Co.	6,687	10	0
Mitchell Brothers	6,519	0	0
C. W. Cox & Sons	6,445	0	0
T. Stimson & Sons	6,438	2	3
S. Lewis & Sons	6,422	0	0
H. Charman	6,414	4	0
Foster Brothers	6,404	0	0
S. Ellis	6,371	0	0
T. G. Messom & Sons	6,370	0	0
E. Chamberlain	6,257	0	0
F. Newbury	6,244	2	6
G. Brown	6,156	0	0
J. B. Seward	6,130	0	0
E. A. Roome & Co.	6,116	0	0
East & Hyde	6,076	0	0
Martin, Wells & Co., Ltd.	6,000	0	0
A. Faulks	5,997	2	2
G. H. Gibson	5,994	0	0
W. F. Wallis	5,984	0	0
H. Flint	5,726	0	0
E. C. Hughes	5,697	0	0
M. E. Fitt	5,640	0	0
W. Watson,* Ascot	5,595	0	0

* Accepted.

Woodville (near Burton-on-Trent).—For the erection of a churchroom in connection with the parish church of St. Stephen. Mr. W. N. Richards, architect, Woodville :—

Ford & Co.	£1,396	0	0
Lowe & Sons	1,324	0	0
G. Godfrey	1,322	0	0
T. Pearce	1,268	8	6
Cartwright Brothers	1,255	0	0
E. Clarke,* Woodville Road, Woodville	1,210	0	0
S. T. Fish	1,192	10	0

* Accepted.

The Haymarket Theatre was reopened this week. Under the direction of Mr. C. Stanley Peach, F.R.I.B.A., extensive alterations have been made at a cost of more than £20,000—the original cost of the theatre when built in 1820. The pit, abolished under the Bancroft management, has been restored and seats nearly 200 persons. The theatre is now a two-tier house, and instead of twelve boxes there are four.

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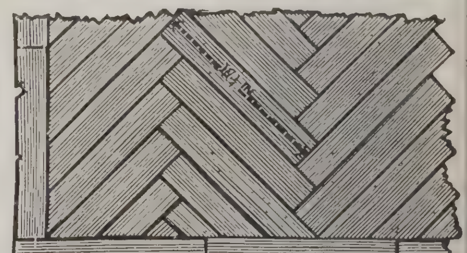

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THE

BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

January 11, 1905. Vol. 21, No. 518.

6, Great New Street, Fetter Lane, E.C.

Summary.

In a paper on public libraries which he ead before the Architectural Association last riday, Mr. Alfred Cox said the rooms should e lofty, with windows high up and, where ossible, opposite to one another, for cross-entilation; the sills being 5ft. from the floor n the newsroom and lending liabrary so as o allow newspaper slopes and bookcases to un continuously around the walls. He did ot like the appearance of skylights or antern lights; they tended to make a room nything but cheerful. (Page 16.)

When an analysis is specified for any ement, the sample should be taken, if at the vorks, as soon as possible after the cement s ground, or, if after delivery to the onsumer, immediately on arrival; and in ither case the sample should be kept hermetically sealed. Unless this is done, no eliance whatever can be placed on the esults of the analysis. When making riquettes for testing, each mould should be eparate, and the briquettes should remain in e moulds (in a damp atmosphere) for wenty-four hours, after which they are careully removed for immersion in water, ccording to the requirements of the specifiation. (Page 22.)

In the Transvaal it seems that the general lea in taking out quantities is to get a ufficiency of "inclusive" items. The uantities issued by the Government are radually training local builders to price ork more in accordance with London ractice, and before very long they may have beneficial effect on the work issued by rivate surveyors. (Page 25.)

During 1904 prices in the timber trade ere dictated rather by what buyers and nporters were willing to give than by what wners and shippers wished to obtain; and ough the year was one of great disappointent to sellers, it did not afford an all-und profit to buyers, because, with a minishing outlet and falling prices, buyers ere constantly left with stock too expensive r their retail customers. (Page 25.)

Reports from all over the country speak of 04 as a very bad year for the building ades. (Page 21.)

The new Associated Building Trades in ew York declare that any trade refusing compel non-union men to obey their rules all be fined £100. (Page 24.)

In Germany a large number of cement orks have been erected within the last ten ears, but latterly there has been great overoduction, and while exports have ineased 28 per cent. the value has declined per cent. (Page 24.)

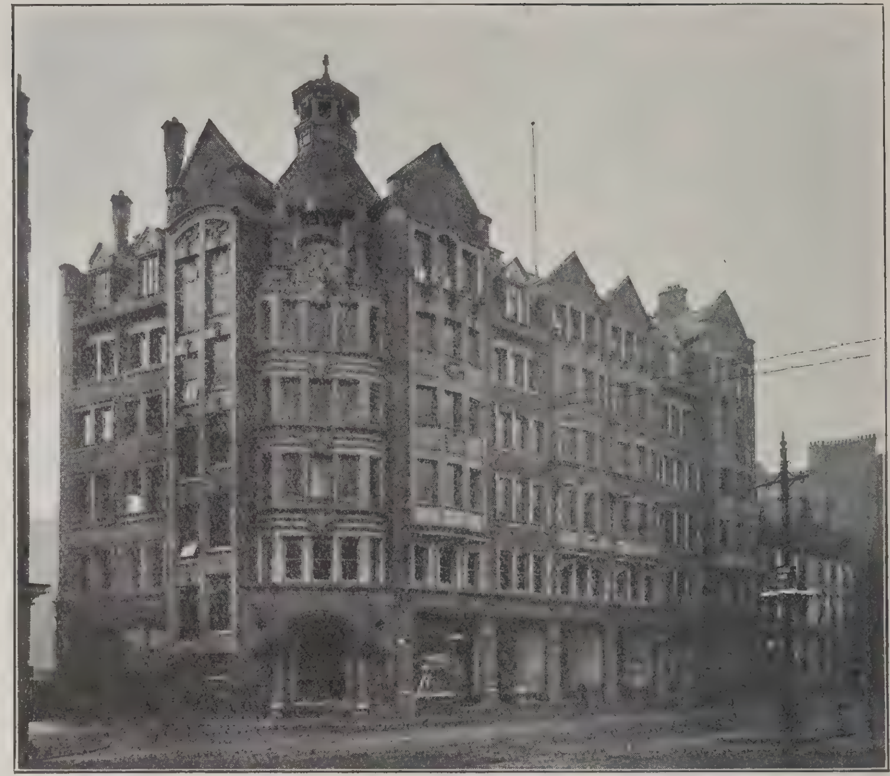
he index to Vol. XX. will be ready next week.

More Alarmist Reports about St. Paul's. It is about time some of the London newspapers stopped publishing alarmist reports about the safety of St. Paul's Cathedral. Periodically one or other of them starts a frantic outburst about the imminent danger of tunnelling, and then proceeds to elaborate sufficient matter to fill a column of sensation. "The Daily Express" is the latest offender. Judging by its heading of "London Undermined. St. Paul's Sinking: Cross 3ft. out of Plumb," one would expect the grand old fabric to be likely to crash down any moment. But the facts are very different. Mr. Harding, clerk of works at the cathedral for the last twenty-eight years, has said that, remembering the huge weight and size of the pile, there has naturally been a slight settlement southwards towards the river, so that the south-west tower is somewhat lower than its companion on the north-west, and the dome proportionately affected; but as for the cross being 3ft. out of plumb—that is pure concoction; at most there may be a deviation from the perpendicular of 1ft., while as regards the general stability of St. Paul's, there is no cause for any excitement, though of course repairs are needed. A fissure in the southern transept undoubtedly exists, but Mr. Harding says it has not widened in the least since he has been connected with the cathedral, nor is it likely to. Certainly there would be danger if any scheme were carried out which would tend to draw off the moisture from the gravel bed which constitutes one of the strata on which the cathedral stands, and for that reason the Chapter has objected to further tunnelling anywhere in the vicinity of the building; but, on that account simply, it is rank nonsense to work up the possibility of a collapse, and the "Express" would do well to leave such methods of journalism alone.

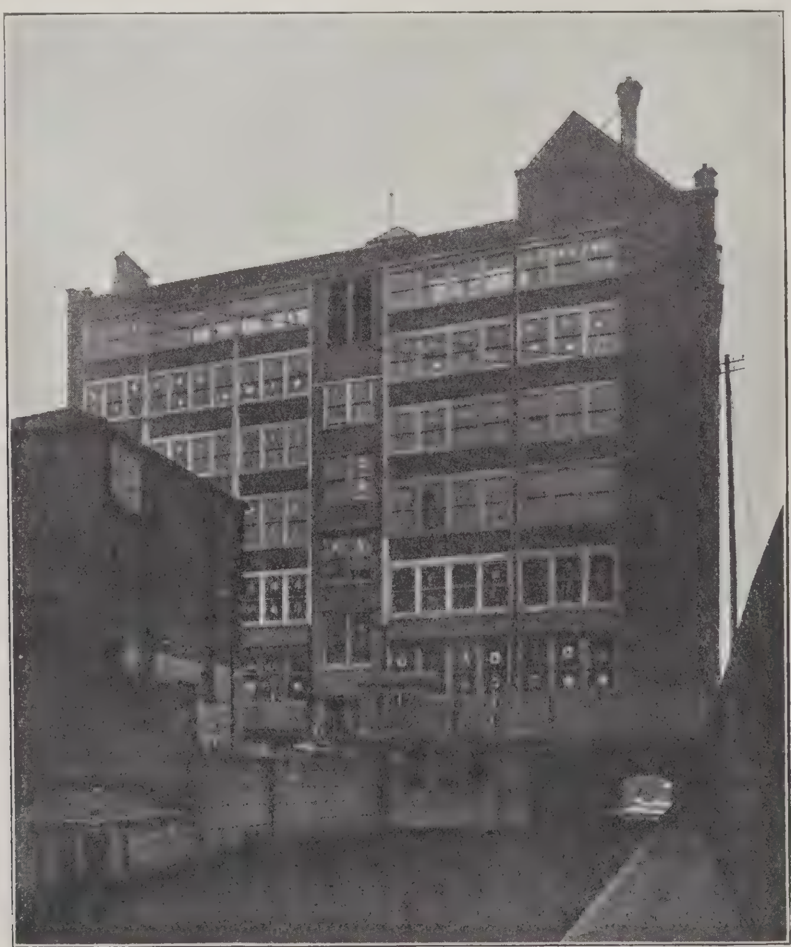
The Everlasting County Hall. While a committee of the London County Council has been instructed to furnish an absolutely definite report in regard to the best site for the county hall, Mr. A. R. Bennett, M.I.E.E., has managed to capture the attention of the newspapers with a scheme of his own which is certainly very magnificent at first sight, though when details are considered we fear it is quite futile. Briefly, Mr. Bennett's idea is to build a new bridge across the Thames from the foot of Arundel Street, to construct new thoroughfares on the other side of the river in connection therewith, to thus link up the north and south tramway systems, and to construct a huge county hall over the entire length of the bridge. This scheme is set forth in a pamphlet most admirably produced, but we do not suppose for a moment that it will be adopted by the London County Council, to whom it was submitted on January 2nd. Primarily, of course, the idea is to save the cost of a site, but that advantage is not compensated by any others. With many bridges, such as Vauxhall, the problem of securing proper foundations is difficult enough, but it is as nothing compared with that appertaining to the erection of such a huge building as Mr. Bennett proposes; and there is little value in citing such examples as the Ponte Vecchio at Florence, the Château de Chenonceau, and the old Pulteney Bridge at Bath, because they are merely toys compared with this, and Old London Bridge, with its houses, offers no comparison. The hall is proposed to be carried on Gothic arches spanning the roadway, with two floors above for offices. "The cost of carrying out the scheme," says Mr. Bennett, "would depend greatly on the method of construction adopted. Steel could enter largely into the fabric of both the bridge and the building, but it is doubtful whether the permanency of steel in such a structure is so well assured as to render its employment prudent, for a building of this kind should not be put up to last for merely a century or so. For preliminary purposes I have estimated for a bridge externally of granite, and internally of Yorkshire sandstone. The vaulting of the bridge, as well as the county hall itself, may be of concrete, ferro-concrete or brick, faced with Carrara ware. On such a plan I estimate that, taking an outside figure, the cost of the bridge, with the vaulting and approaches from the Strand to Stamford Street, and tramway connections, together with the acquisition of the necessary property on both sides of the river, would be about £2,500,000." The scheme, we think, will hardly commend itself to the officials at Spring Gardens, necessitating at least some sort of travelling footway so as to get from point to point (for it takes a full five minutes to walk across Waterloo Bridge), while the semi-darkness and the discomfort caused by the wind that would sweep under the vaulting in bad weather—sufficient already on open bridges—will not make the proposal more attractive to the general public likely to use the bridge. No, having waited so long for a county hall, and having lost the great opportunity afforded by the Strand improvement, such a scheme as this absolutely fails to satisfy us.

HOYLE'S WAREHOUSE, MANCHESTER.

THIS week we publish the last of our photographs illustrating the erection of the above building. At the time when our first photograph appeared, in March last year, the old building had been simply removed from the site and preparations were being made to excavate for the foundations for the new work. The first photograph was taken on February 27th; therefore, to all intents and purposes, the whole work from start to finish has been absolutely completed in less than ten months. This is a very creditable performance, considering the extremely complicated nature of the work. It should be remembered that the Rochdale Canal runs right under the building, and it was necessary to arrange that the traffic on the canal should not be impeded in any way. It was impossible to use the tow-path or barges for bridging purposes, so that all work had to be placed in position from above. There was also a large lay-by for barges, which has been covered by the new building. Great difficulty was experienced with the foundations generally owing to lamination of the clay and percolation of water. The building is fitted with two hydraulic goods hoists and a push-button lift for passengers. This latter acts automatically and requires no attendant. When it is required on any floor, the button is pressed and the lift comes to the point required, and stops there, the doors opening automatically. The building is heated and ventilated throughout by means of purified air (which can be regulated to any temperature required), and hot water, and is lighted with electric light and gas. All departments are served by pneumatic tube plant and a telephone installation. Each shop takes its water and electric light through a submeter, and each is also fitted with gas- and a sub-meter. The floors, a typical view of one of which is given on the opposite page, are calculated to carry $2\frac{3}{4}$ cwts. per sq. ft. and are of fire-resisting construction. As shown, they are well lighted and clear of interior walls.



HOYLE'S WAREHOUSE, PICCADILLY, MANCHESTER. *(Photograph taken on December 10th, 1904.)*
CHARLES HEATHCOTE AND SONS. ARCHITECTS.



HOYLE'S WAREHOUSE, MANCHESTER: BACK ELEVATION.
(Photograph taken on November 20th, 1904.)

THE ARCHITECTURAL ASSOCIATION.

Mr. Alfred Cox on Libraries.

A MEETING of the Architectural Asso
ciation was held on Friday evenin
at 18, Tufton Street, Westminster, the chai
being occupied by the president, Mr. E. Gu
Dawber, F.R.I.B.A.

It was announced that Mr. H. C. Chevalie
and Mr. F. C. Moscrop-Young had rejoine
the Association.

Further donations to the Building Fun
were announced as follows :—

	£	s.	d.		£	s.
John Bolding & Sons, Ltd. -	10	10	0	Reade, Reilly & Jackson - -	2	2
W. Flockhart -	10	10	0	Joseph Swarbrick	2	2
W. H. Brierley -	5	5	0	R. Douglas Wells	2	2
Thomas Faldo & Co., Ltd. - -	5	5	0	Woolfall & Eccles	2	2
J. Simpson & Son	5	5	0	E. A. Agutter -	1	1
Sir C. A. Nicholson, Bart. -	5	0	0	H. O. Cresswell -	1	1
A. Maryon Watson - - -	3	3	0	H. G. Gamble -	1	1
T. C. Yates -	3	3	0	Ham Hill & Doulting Stone Co., Ltd. -	1	1
F. Lishman -	3	0	0	Nathaniel Hitch -	1	1
Percivall Currey	2	2	0	A. P. Lambert -	1	1
G. B. Bulmer -	2	2	0	E. Godfrey Page	1	1
Henry Martin -	2	2	0	F. J. Osborne Smith - -	1	1
Mussellwhite & Sapp - -	2	2	0	B. D. Tracy -	1	1
				H. Hughes - -	1	0

Mr. Alfred Cox then read a paper c
"Public Libraries." He did not deal wit
the history of libraries, but with the buil
ings themselves, and more particular
with the smaller class of public library cos
ing from £2,000 to £10,000. After makir
passing reference to books and papers on tl
subject, and to libraries erected through tl
generosity of certain individuals, more esp
cially Mr. Andrew Carnegie, Mr. Passmo
Edwards and the late Mr. Henry Tat
Mr. Cox said:—In the first place, it is
the greatest importance that

A Suitable Site

should be provided for. On this almo
entirely depends the satisfactory plannir
and general economical arrangements of tl
building to be erected on it. It should,
course, have good light around it, and al
be in as central and yet as quiet a positi
as it is possible to obtain. It should be lar
enough to allow of any probable futu

extension of the building to a reasonable degree; but in the case of suburban towns, which spring up like mushrooms and develop at a rate far beyond the most careful calculations, the best solution of this problem will possibly be by means of small branch libraries erected in suitable positions.

With regard to the

General Arrangements of the Plan,

these should, of course, like any other building aiming at satisfactory results, be very simple, and, if possible, all the public rooms arranged on one floor. Often, however, this cannot be done owing to the limitations of the site, and in such cases the more public rooms to which most easy and ready access is required, such as the newsroom and the lending department, should be placed on the ground floor, and the less frequented rooms and those for special study, together with the librarian's office, on the upper floors.

Supervision

is of the first importance, and in planning should be always borne in mind. It is usual to arrange for this by placing the staff-counter in an enclosure connected with the lending department in such a position that the attendants, who are generally at work there the whole day long, can command the main entrance and as many of the rooms as possible. In connection with this it is a mistake to conclude that the librarian is the policeman of the building, his work being of far greater importance than that, although probably in very small libraries he may have to do all the work, with possibly the assistance of a youth. He should be in a position near his assistants, but it is not necessary to place his room in a prominent position as regards the public.

All the public rooms should be lofty and well-lighted; the ventilation should be especially considered, so that the air can be changed frequently, as at certain times in the day these rooms are often crowded, and any feeling approaching to stuffiness is most unpleasant, besides being unhealthy for the readers; moreover, it renders the work of the attendants who are there always doubly trying.

Architectural Treatment.

A free public library, as a rule, has to be completed for a sum that allows little for architectural splendour, but the requirements, being generally very simple, lend themselves admirably to a successful and dignified treatment, provided the designer confines his attention to such vital matters as good proportion and simplicity, with suitable details of whatever style he may adopt to emphasize them, and not be carried away by any unnecessary feeling that the building wants breaking up somehow. This breaking-up, as a rule, is quite superfluous to the real requirements of the plan, embracing very often as it does bay windows and odd corners, neither of which are happy features in the public rooms of a free library, and is but too often the amazing conceit of the pencil as opposed to the common-sense of the india-rubber.

After all, the public library is, or should be, a local centre of culture, and, apart from the books, the building itself should be of such a character as to elevate the minds and educate the public in the art of architecture, and make them feel that they are in a place which inclines them to improve their minds and morals in every way. I am afraid library committees often overlook this, and disregard the real and good in architecture in favour of the more showy on paper, which often masks an ill-arranged plan; the former being looked upon as a sort of joke, and likened to a stable, a workhouse, or any other building which they do not associate with architecture, but think merely bricks and mortar; whilst the latter, exhibiting all the tricks of draughtsmanship to illustrate the commonplace, is loudly appraised.

I will now give you a more detailed description of the internal arrangements of a library, though I think these are pretty generally known; however, the memory cannot be refreshed too often, and possibly if most of it is forgotten some of it will stick and prove useful in the future.

The Entrance

should be spacious, and open into a good-sized hall or broad corridor, which lend themselves to be particularly studied as the architectural features of the building. First appearances go a long way, and I should always endeavour to make the entrance attractive.

From this hall as many of the rooms as possible should be directly approached; the more-frequented rooms, as I mentioned before such as the news and lending rooms—being, if possible, nearer the entrance.

The Lending Library.

The counter or enclosure of the lending library should be conspicuous on entering, and, to my way of thinking, is better entirely open than having to pass through swing-doors to reach it.

HOYLE'S WAREHOUSE, MANCHESTER: TYPICAL FLOOR.
(Photograph taken on November 20th, 1904.)

The lending library should be arranged so as to be worked either by the indicator system or by a more recent method known as the "open access." In the former case there must be a long counter for the indicators, with issue spaces in between them The amount of space occupied by the indicators varies from 35ins. to 10ins. for each 1,000 numbers, according to the particular type adopted. The counter should be somewhere about 32ins. high, so as to allow children and people of small stature to clearly see the top numbers of the indicators. The length of counter would be determined by the number of indicators in use, and a sufficient allowance should be made for possible extensions. As regards the issue desks, two, each at least 3ft. wide, should be allowed to every 10,000 volumes. Good light on both sides is very necessary, so that the public on the one side and the attendants on the other have no difficulty in reading the numbers. In the case of the "open access" system, there must be an enclosure of ample size at the entrance to the lending library. Bookcases should be arranged "end on" to the counter or enclosure and in close proximity to them.

The stackroom might be made high enough to take two or more tiers of bookcases over the lower ones by having a light floor of perforated iron gratings between them. These floors would be reached by a straight staircase of about 3ft. 6ins. minimum width. A circular staircase is not desirable. A book-lift in a well-considered position is of course essential where there are more than one tier. With regard to bookcases, these are about 16ins. for a double one (that is, for books on both sides), the height being anything between 7ft. and 8ft., and often a step is provided so that short people can more easily read the upper shelf. Wooden shelves are generally $\frac{7}{8}$in. thick and should not be longer than 3ft., as anything more than that is awkward to use, and liable to sag. Wooden shelves have a better appearance than iron, and are cheaper, and if corners are rounded they do not damage the bindings of the books so much.

Iron shelves are of course more fire-resisting, but unless the whole building is made absolutely fireproof there is no real advantage in them. The bookcases should not be at a less distance apart than 3ft., otherwise it is difficult to stand far enough back to see the upper shelves and at the same time allow people to pass. In the case of the "open access" a greater distance still should be allowed, and 4ft. taken as a minimum. All counter-tops should be of polished hardwood, floors as noiseless as possible—wood blocks or cork carpet being generally used—walls with glazed brick or tile dados in public rooms and lobbies, heating by coils on low-pressure system with a sectional independent boiler, inlets behind radiators and grids in the ceiling.

The Reference Room,

being used by students and readers of more serious books, would necessarily be placed in the quietest part of the building, and in such a position where it would be unnecessary to be passed by people going into the other rooms. I suggest as a good place for it within the lending library counter, so that readers—as a rule there are not many—could pass into it through a wicket gate, which would be under the control of the attendants. The books, too, in this room, being of more value, are thus afforded better protection, and the attendants know who the people are that pass into the rooms.

In the case of a small library, a space for a table to be used by reference readers might possibly be arranged in the lending library itself by arranging the bookcases in a suitable manner, and I think in many cases this would give all that was required.

In some buildings a separate room is provided for juvenile readers, and great care must be exercised in planning so as to put this in a position near the attendants, and also where the occupants cannot make themselves a nuisance to the other readers. A separate entrance from the street is sometimes provided for this room, but I do not think it is a good arrangement, as, among other things, it makes an easy escape for the mischievous youngster after "cheeking" the attendants, and has many objections.

One Main Public Entrance

for all parts is the simplest, and gives better control than where there are more. In a library building of ordinary size I do not see why the principal entrance should not open into a large space, which could be subdivided by arches or columns with balustrades, so as to group the various readers into the usual sections — magazines, news, lending, &c. Surely one person reading a newspaper and another a magazine can do so without having a solid wall or even a glazed partition between them. This arrangement would give excellent control, and there would be no annoyance caused by such small matters as the opening and shutting of doors. Of course, great care would be necessary to exclude draughts, but I can see no difficulty in this any more than in a building of a larger area.

The Librarian's Room

is well placed on the counter enclosure side of the lending library. It need not have any direct communication with any of the public rooms; in fact, it is an office, pure and simple, where the occupant has much work to do without being continually worried in the control of the public using the library. This room is often used for the meeting of the library committee. With regard to the

Lavatory and Water-closet Accommodation

for the public, this is sometimes provided, but in a small library I think it has many objections, and is liable to be a great nuisance. Of course, it is necessary to provide for the staff, and in many cases for both sexes, as female assistants are now very commonly employed.

Store-room, Workroom, Librarian's Residence.

A good store-room and workroom and a mess-room for the staff should also be provided within easy access of the lending library, and a separate entrance for delivery might be arranged in connection with these rooms. In many libraries a residence for the librarian is arranged, and suitable accommodation for it is to provide two sitting-rooms, kitchen, scullery, pantry, with three or four bedrooms, bathroom, &c. In other cases the caretaker will only live on the premises, and in his case the provision of a kitchen with scullery and pantry, a living-room and two bedrooms and a bathroom should be sufficient.

With regard to the

Style of the Rooms

themselves, the larger ones should be treated as small halls rather than rooms, and the satisfactory lighting of them must be carefully considered. Good lofty rooms with windows high up, and where possible opposite to each other for cross ventilation, is a good arrangement; the height of sills from the floor line being about 5ft. up in the newsroom and lending library, so as to allow newspaper slopes and bookcases to run continuously round the walls. In the other rooms the ordinary sill height is preferable. Personally, I do not like the appearance of either skylights or lantern lights—they tend to make a room anything but cheerful, and the idea of not being able to see out at all is objectionable. Of course, in certain cases it is difficult to do without them, but if possible always try hard to avoid them; at all events for your main lighting. They are also unsightly things on the outside, and rather make a building look like a hotel billiard-room or swimming bath. In a small library rectangular rooms would be the best and most economical for furnishing. Bay windows and odd corners are wasteful, and not easy of supervision. Unless there is anything against it, clear glass is preferable for the windows, and if any coloured glass be used, let it be done sparingly and be of the best quality.

Some Notes by Maurice B. Adams.

Some notes on Mr. Cox's paper were read by Mr. Maurice B. Adams. After referring to Mr. Cox's libraries at Kingston-on-Thames and Wakefield, Mr. Adams observed that in all specialized work like that of libraries it was essential for the architect to cultivate a more or less intimate acquaintance with its process of contemporary development. The library to-day was already in a transitional stage, emerging from comparative obscurity to the full recognition of adequate importance long enough ago accorded to it in America.

Continuing, Mr. Adams said a library should be made to look just like what it really was—not a school, nor a house, a town hall and offices, nor a church! Often the special characteristics of the building were masked by too close an adherence to traditional architectural lines, instead of allowing the particular needs of the interior to determine the exterior treatment. Mr. Cox had alluded to the effect of skylights and their likelihood to make a library resemble a public bath, or perhaps a billiard-room. In parentheses Mr. Adams observed that, quite apart from appearance, roof lights were open to several objections in a library, and especially if no ceiling lights were also provided: they were noisy during heavy rain, and were too subject to variations of temperature, causing down-draught, as well as difficulties in keeping them water-tight. Ceiling lights also became very dusty and needed provision for easy cleaning. Mr. Adams said he much preferred vertical dormers and lantern lights—they aided ventilation better, and, at least, were capable of architectural treatment. Still, skylights had to be employed at times, and by preference one put them on the rear slopes of the roof, out of sight. Where no choice was left, and they had to be located where they otherwise would be conspicuous, he thought they could be masked by good tall parapets, because such sloped lights need not be near the ridge. This idea of a parapet implied a cornice, and that in turn indicated a monumental façade necessitating a more than usual breadth of handling and scale.

Then, again, Mr. Cox had intimated that angles, bays and projecting features had a tendency to break up designs needlessly and obstruct supervision, which, in a way, was perfectly true. And, further, he had suggestively dilated on window contrivances. Everyone knew that windows placed low down in libraries wasted internal wall-space and encouraged loafing, which constituted one of the bug-bears of modern reading-room work. Then added to the possibilities of fenestration arrangement there was ample scope for inventive skill in the management of the main entrance to the library. Lastly, however, and dominating all these details, was the primary advantage of facility of supervision, always and only to be ensured by making all the public rooms on one floor. Consequently the general outline of an ideal library, where the site allowed this arrangement, should be comparatively low in proportion, with a spreading plan.

For style, the late Renaissance appeared best adapted to present-day needs. As to the architectural treatment of reading-room interiors by arcading and intercolumniation, opening up the whole series of apartments into one large undivided whole, no doubt the lecturer's suggestion possessed the merit of ambitious possibilities, but the vast majority of librarians preferred separate rooms for newspapers as distinct from magazines.

Mr. Cox had not mentioned the essential differences of the open-access library as contrasted with the indicator system—a very crucial point of the utmost consequence. He had, however, suggested apparently in any case that the reference-room entrance should be behind or within the lending library counter. This plan, Mr. Adams thought, was open to the objection that when the issue of books closed on certain evenings of the week no one would be able to use the reference-room without exposing the stackroom to intrusion, and it was most desirable to keep the reference-room always open for access to directories and other reference books usually kept in these apartments, and, of course, for reading the heavier monthlies and quarterlies. As to the further observation about permitting the reference-room readers to have a table in the lending library stackroom, and group the bookcases suitably for the purpose, it would be hardly possible to discuss that point without opening up the whole question of library administration, which, to a considerable degree, depended on the burning problem of rate-aid *v.* State-aid, and it also touched the crying need of reference-room development.

Discussion.

Mr. Henry T. Hare said that although a library was one of the simplest buildings, still in some senses it was one of the most difficult to plan. He doubted whether it was possible to secure an absolutely satisfactory plan, even with a perfectly free site. One of the chief requirements was that there should be complete supervision of all parts. Yet there appeared to be much confusion of idea in regard to this. The common idea was that the supervision was done by the staff: so that in most plans the several rooms were grouped around the reference-room. As a fact, however, the supervision was done by the porter, who walked from room to room, the staff being usually occupied with other duties. If this fact were remembered, matters would be simplified. The real solution of the problem would be to do away with all separate rooms, and the most satisfactory plan for a free library would be one great hall. In his opinion there was no necessity for an entrance hall. One should enter the library direct from the street, though double doors could be provided if thought desirable. The lending library was not bound to be on the ground floor. Most people went into the news and magazine rooms, and the lending library was generally only open on certain days and at certain hours. The reference library was usually upstairs, and it was an advantage to place the lending library there too. All the books could then be brought together under the direct control of the same staff. The ground floor could be devoted to the news and magazine rooms, which would be supervized by the porter. The only difficulty in adopting such an arrangement was to get rid of the staircase; he thought, however, this could be overcome. Most library committees seemed wedded to the idea of a caretaker's house being included, though one could be rented outside for about a quarter the cost. Speaking of indicators, Mr. Hare said librarians generally had an exaggerated idea as to the size of these; there was no necessity to indicate every book in the library; in a big library, even, an indicator for 5,000 or 6,000 books was ample.

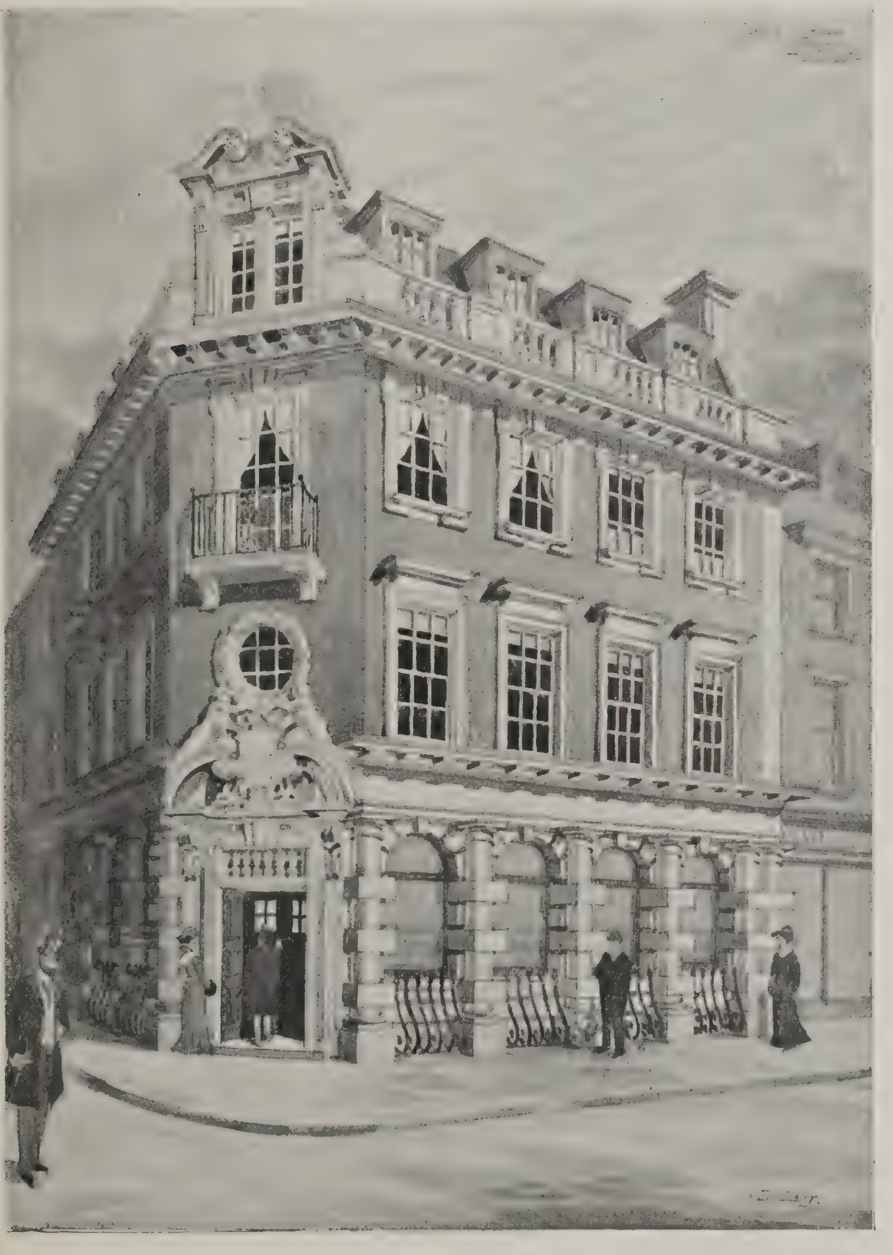
Mr. S. D. Adshead said that, in theory, the "open access" system was the best, but in practice the indicator was: under the "open access" system the books were injured and constant supervision was necessary, and this sometimes became quite a nuisance; in poor districts the "open access" system was out of the question. As to the general type of plan for a library, he favoured one large room, though he saw no objection to employing division screens in order to avoid confusion—in any case the reference-room should be kept separate, and as quiet as possible. The provision of lavatory accommodation depended on the position in which the library was situated and the class of people using it; in some cases such accommodation was very useful, while in others it became a nuisance. Top-lighting, in his opinion, was desirable, but some side windows should also be provided to secure proper ventilation. In newsrooms it was better to have slopes around the walls rather than stands, as the latter caused dodging and blocked up the room. The walls of the reference library were best lined with books, and if need be the lending library might be restricted for this purpose.

Mr. Sydney K. Greenslade spoke of American libraries and their general superiority over those here. All the rooms were practically exposed to the counter. Children's rooms were a feature. As a rule, the smaller libraries comprised four rooms, namely, a central entrance hall, a room on either side, and a stack room at the back, with space for the attendant. In many American libraries the lending department was upstairs. In the great national library at Washington there was provision for 3,000,000 books, housed in enormous rooms called "stacks," having steel frames and shelves of steel with rounded edges and slots for dust to fall through and for ventilation. In this country, he said, we were far behind America in the erection of libraries. There they did things on a better scale. Why, at the British Museum, the present scheme of enlargement seemed to be a muddle; the day would come when the Government would have to settle whether the institution was a library or a museum.

Mr. Taylor next spoke, after whom Mr. Arthur Keen referred to the fact that Sir John Soane's interiors (which were among the most successful) were hardly ever lighted from the side: at the Bank of England all the big rooms were lighted from lantern lights or domes with eyes.

Mr. Dawber agreed with Mr. Adshead that lavatory accommodation for the public was overdone. In many cases it was quite unnecessary and only led to abuse.

The president announced that the next meeting would be held on January 27th, when Messrs. J. B. Fulton and E. F. Reynolds would read papers on "Byzantine Architecture," at 7.30 p.m.



BANK AT NOTTING HILL, LONDON, W. NASH AND DETMAR, ARCHITECTS.

This building was completed last year for the London City and Midland Bank. The drawing shows the original design for rebuilding, but owing to circumstances this had subsequently to be modified. The materials are red bricks and Portland stone. The internal fittings and screens were executed by Messrs. Waring and the electric-light fittings by Messrs. Durtnall & Pries. Messrs. E. Lawrance & Sons were the contractors.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Book on Nonconformist Architecture.

ROTHERHAM.—DISSENTER writes: "In a recent issue of the 'Methodist Recorder' Messrs. Crouch & Butler, architects, Birmingham, were stated to be the authors of a volume on Nonconformist architecture. Can you give any particulars of this book?"

We have never heard of it.

Architectural Assistants in the Colonies.

ARCHITECTURAL ASSISTANT writes: "What are the prospects of an architectural draughtsman in the Victorian Colonies, say Dunedin, Wellington, Christchurch, Melbourne and Sydney?"

There is not much opening in Australia; New Zealand is far more promising, all reports we have had indicating that the building trades are very active in every centre there.

Chimney Pots and Flues.

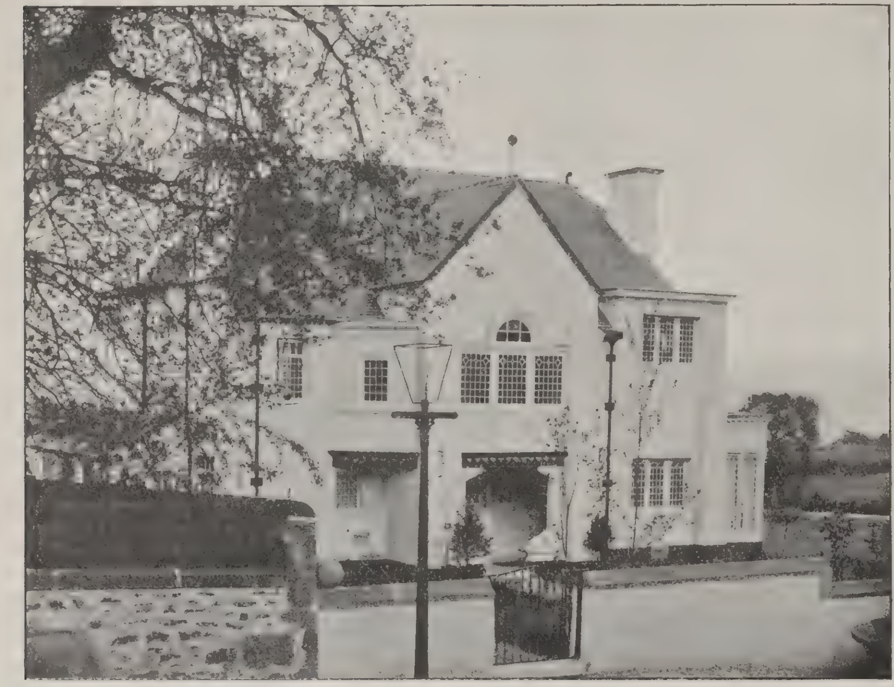
BLACKBURN.—H. C. writes: "Is it beneficial or otherwise to partly choke a chimney flue by placing a circular pot on a square flue? What shape of pot is best for a 14in. by 9in. flue? Some people think the narrowing of a flue at the top quickens the draught. Is this really so? Having a chimney coping pierced for a circular pot to a 9in. by 9in. or 14in. by 9in. flue, should the brickwork below be narrowed so as to reduce the flue gradually, or should it cut off suddenly by just placing the coping on the full width flue?"

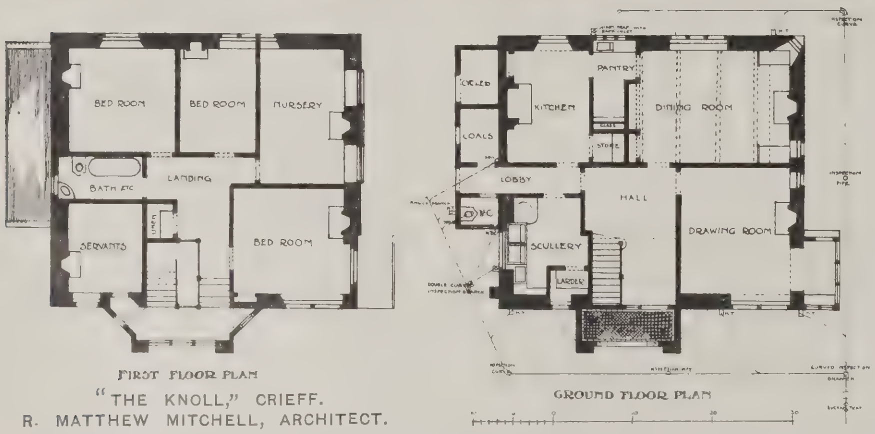
A flue should not be narrowed towards the top. The quickness of the draught depends upon the cubic capacity of the chimney, and any narrowing restricts the draught. The pot should be of equivalent area to the flue.

Reinforced Concrete.

CARDIFF.—G. A. B. writes: "On p. 335 of your issue for December 21st you mention a M. Coignet opening a branch in London, thus adding one more name to the increasing list of contractors for this kind of construction in this country. Please give names and addresses of firms who erect buildings with reinforced concrete."

The following English firms execute reinforced concrete work:—New Expanded Metal Co., Ltd., York Mansion, York Street, Westminster; Stuart's Granolithic Stone Co., Ltd., Glengall Road, Millwall Dock, E.; Columbian Fireproofing Co., 37, King William Street, London; Fireproofing Co., Ltd., Waldo House, York Buildings, Adelphi, W.C.; A. E. Williams, A.M.I.C.E., Dagenham Docks, Essex; Homan & Rodgers, 17, Gracechurch Street, E.C. The following are English agents for various foreign systems:—Hennebique system, L. G. Mouchel, 38, Victoria Street, Westminster; Coignet system, G. C. Workman, 43, Chancery Lane, W.C.; Cottancin system, A. Vye-Parminter, 27, Avenue des Acacias, Paris; Klett system, F. H. Rudolph, 68, Victoria Street, Westminster; Koenen system, R. B. Roxby, 18, Featherstone Buildings, Holborn, W.C.; Maciachini and Visintini systems, C. H. Reynolds, Clevelands, Teddington; and Monier system, H. C. Werner, 4, Westminster Palace Gardens, Artillery Row, S.W.





FIRST FLOOR PLAN

GROUND FLOOR PLAN

"THE KNOLL," CRIEFF.
R. MATTHEW MITCHELL, ARCHITECT.

This house is built of rough rubble harled on the outside, and covered with Collier's tiles. All the internal finishings and fitments are carried out in selected American cypress, which lends itself exceptionally well to staining purposes. The stained and leaded glasswork in the casements and doors was executed by the British and Foreign Glass Co., Glasgow.

Heating a Church.

IPSWICH.—J. H. C. writes: "The accompanying plan (not reproduced) shows the heating apparatus of a church, which is quite a failure although there is a good saddle boiler. Pipes rise 1in. in 10ft., and the circulation seems fairly good, but even after a fire for twenty-four hours there is not more than 2 degs. more heat in the building. The pipes are 4ins., laid in very narrow trenches, with 6ins. perforated gratings over. It seems to me that the whole of the heat is absorbed by the ground, being so close to the pipes. Could you suggest an alteration that could be carried out cheaply? Could the pipes be packed and radiators or coils worked from them? I think the boiler is large enough and has a good draught."

The height of the church is not given, but if it averages 18ft. the cubic contents of the building is nearly 50,000ft. If the worshippers are numerous and fill most of the seats, an allowance of 5 sq. ft of pipe surface to each 1,000 cub. ft. should be sufficient; but if they are few, 6 to 1,000 will be needed. The surface of the pipes now laid is about 190 sq. ft., and this is not enough for 50,000 cub. ft., even if the pipes were in the open or in a wide trench instead of a too narrow one. The trench should be twice as wide as the pipe. The cheapest way to amend the apparatus is to fix coils or radiators along the passages at the pew fronts and backs, as indicated; those near the doors being fixed, if possible, to catch the wind that blows in when the doors are opened. If coils are chosen the pipes should be small, 2in. or 2½in. bore, or at most 3ins.; and radiators should be long and not high. The circulation may be reversed by this extra heating surface, though I do not expect it to be. Valves will not be needed, but the expansion and filling cistern may have to be re-fixed at a higher level than the topmost point in the coils or radiators. O. WHEELER.

Surveying Levels.

TEDDINGTON.—K. J. E. writes: "What are the advantages and peculiarities of the dumpy-level over the ordinary level?"

The form of level now in ordinary use is the dumpy. The Y-level is now rarely seen. Any text-book on surveying would explain the differences between these instruments, both in construction and use, while such an explanation would occupy several pages of THE BUILDERS' JOURNAL and need to be very fully illustrated. You would do well to get either Middleton's "Surveying and Surveying Instruments" or Whitelaw's "Land Surveying." M.

Tour around Lincoln, Peterborough, &c.

ROCHDALE.—STUDENT writes: "I intend making the following places centres for a touring holiday next summer, and shall be glad if you can tell me of anything of special architectural interest in the immediate vicinity (say within a 4-mile radius): Lincoln, Peterborough, Ely, Cambridge, Oxford and Lichfield. Are there any abbeys near these places? What is the nearest railway station to Kirby Hall, and are there any places near where one could put up for a day or two?"

Besides the cathedrals in the above-named places, the following churches and buildings are of interest:—St. John's, Lincoln, and the church at Burton; Peakirk, near Peterborough; Cambridge: St. Mary the Great, St. Sepulchre's, King's College Chapel, Trinity College Chapel, St. John's and Trinity churches, and the churches at Barnwell and Cherry Hinton. Some Elizabethan work is to be found at Caius, Sidney Sussex, Trinity, Clare and St. John's colleges, while Wren also did some work at Trinity College Library. Oxford: St. Giles, St. Mary the Virgin, St. Michael and St. Mary Magdalene churches, Sheldonian Theatre, Bodleian Library, and All Souls, Magdalen, Merton, New and Trinity colleges; while there are beautiful churches at Iffley, Begbroke, Cassington and Handborough. At Lichfield, St. Michael's Church should be seen. Kingscliffe would be the most convenient station for Kirby Hall if travelling from the east, and Gretton if from the west. There are a few villages in the vicinity where you could probably put up for a few days. The programme you have laid out is absurd unless you can give at least six months to it, and even then the greater part of your time could well be spent on the cathedrals alone. G. A. T. M.

Civil Service Surveying Department.

LINCOLN.—W. C. B. writes: "Which are the most useful subjects to be coached in when studying for Civil Service (Surveying Department)? Where can text-books be obtained?"

You should first write to the Civil Service Commissioners, Burlington House, London, W., and obtain particulars of all the examinations for Civil Service appointments in which surveying is a subject. Next discover which of these suits you best. You will find that these examinations vary very considerably in the subjects taken and in the prospects they offer to the successful competitor. It would, therefore, be the best plan for you to write to one of the Civil Service tutors whose advertisements may be found in this journal, stating either the examination in which you intend to compete or detailing your knowledge and experience in order that he may advise you concerning your best course of study. The question of books is one which must be kept until you have decided what examination you intend to take, and if you place yourself in a tutor's hands his advice should be followed. M.

Fire Tests.

HACKNEY.—UNCERTAIN writes: "What is the approximate heat to which fireproofing materials for walls, partitions or ceilings are subjected by any particular associations or bodies who undertake tests?"

About 2,000 degs. The British Fire Prevention Committee undertake such tests.

Payment for Additional Brickwork.

LONDON.—E. T. T. writes: "I agreed to take down and rebuild a part of two fronts (top floor) similar to two adjoining, previously done, which consists of 9in. brickwork. The two I have done are 14in. brickwork, and the surveyor will not pay for the extra 4½ins. Can he be made to pay?"

This depends almost entirely upon the wording of the contract. Of course, if the surveyor prepared plans and specification of works, he is liable for the extra cost of the additional walling; but if, on the other hand, you, after viewing the premises, undertook to take down and rebuild the two fronts at a certain price, I am of opinion that you are supposed to have known what you were doing and must bear the cost. F. S. I.

THE BUILDING TRADE IN 1904.

WE are unfortunately again compelled to chronicle a general depression in the building trades during the past year. 1901, 1902 and 1903 were bad years, but 1904 was still worse. The trade of the country has been passing through a cycle of depression, and the building trades being dependent thereon are naturally adversely affected. Tightness of money prevents the erection of speculative property. Municipal enterprise in contracting work has disturbed the market and checked individual effort by the placing of large loans, thus affecting gilt-edged stocks and withdrawing from speculation very large sums of money which would otherwise be invested in profit-earning concerns. Members of corporations, unlike individual traders, have not to bear the personal responsibility of their financial operations; deficits are met by fresh loans and by raising rates on property, thus placing another check on commercial enterprise so far as the builder is concerned. Materials have become cheaper. Of course there is always at this season a large number of unemployed, but the proportion this year is larger than in former years. The Board of Trade returns point, however, to an improvement in the general trade of the country, which augurs well for the future, but the building trades are bound to follow somewhat tardily because they will have to wait until the public recover from the strain.

London.

The building trade in London has suffered severely, though of course in a large city there is always much work going on. The speculative building of small houses has been diminished and commercial premises are also a backward feature. The rebuilding of Central London continues to make rapid strides.

Bradford.

The building trade in Bradford has been very depressed during the past year, and especially in the last few months. It is stated that the depression has not been so acute for nearly twenty years past. Amongst local builders the belief prevails that practically all classes of houses have been overbuilt. There is not a particularly sanguine feeling as to the prospect of better conditions in the immediate future. The local stone trade has not been so good as in recent years. Prices have fluctuated a good deal during the year, and have had a tendency to lower rates than last year. The London trade also has slightly fallen off.

Darlington.

The position of the building trade has been somewhat worse during the past year than in 1903, partly attributable to overbuilding during the previous good years. There has been an absence of speculative building.

Darwen.

Trade has been very bad during the past year. Only 169 sets of plans for new buildings of every class have been deposited, the lowest number for many years. No plans for new public buildings or schools have been deposited, although there have been minor extensions of the latter. Only 116 new houses have been erected; this is slightly below the average of the past four years, and somewhat more than one-third of the number erected six years ago.

Leeds.

During the past two or three years the depression in the building trade has been most acute, it being realized last year that it would be hardly possible for the trade to be in a worse state. It was anticipated that after a protracted period of slackness trade would revive, and the new year was confidently looked forward to in the hope that the condition of things would materially improve. Very little improvement, however, took place, and if possible the state of the trade was worse at the end of the year than it was twelve months previously. In fact, it is stated that it was never known to have been so bad. Overbuilding has been going on for a long time, and as a consequence prices have ruled low. Very little speculative building has been done during the year. Quarryowners have experienced a great slackness in trade and brickmakers have been "stacking" for some time past. A better condition of affairs is looked forward to in the future, a number of large contracts being in prospect.

Leicester.

Here again the trade has been depressed. Since 1898 the number of plans passed by the Corporation diminished successively from 3,901, 3,456, 2,914, 2,529, 2,311 and 1,925 to only 1,785, or to less than half the maximum of 1898. The slump has occurred chiefly in houses. Since 1898 these have fallen from as many as 2,404 to but 865.

Liverpool.

Trade has been fairly brisk.

Manchester.

The year is stated to have been one of the worst that has been known in the building trade for over thirty years. There has been less ordinary competitive building in the city of Manchester and the district round about than has obtained for a generation. Since the beginning of 1904, 778 sets of plans of buildings have been submitted to the Corporation, and of these 704 were passed. In the same period 1,525 dwelling-houses were certified as fit for habitation, the lowest figure recorded since 1895, when 1,088 were built.

Newcastle.

There has been considerable activity in the Newcastle building trade, the development of outlying estates for residential purposes, not less than the transformation of central out-of-date premises into modern shops, warehouses and offices, being continued with much enterprise. The progress made in the rebuilding of the centre of Newcastle is steady.

Newport, Mon.

A considerable impetus to the building trade of Newport is opened up by the laying-out of new streets on the Eveswell estate.

Nuneaton.

Although trade during the year has been bad throughout the country, the Nuneaton Council were called upon to pass plans for 345 dwelling-houses, and nearly half a mile of new streets was laid out.

Portsmouth.

Last year 800 houses, more or less, were built within the borough limits. New building by-laws were adopted, and immediately after they came into force there was a falling-off in the number of plans submitted.

Salisbury and Amesbury Districts.

During the past twelve months there has been much activity in the building trade in Salisbury. Many important blocks of business premises have been completed. Estates are being developed on the old Castle Road and another has been started near Wilton. There has been much demand lately for villa residences in the Salisbury district owing to the city having become a business centre for the camp at Bulford.

In the Amesbury district much building has been pushed forward and a large estate at Durrington, a village three miles distant, is being developed to accommodate persons connected with Bulford Camp.

Sheffield.

Here there has been depression, though the building trade has not suffered so severely from the unsatisfactory condition of business as have many other branches of industry. In 1903 the plans deposited with the city surveyor for buildings of various kinds numbered 1,296, and for the twelve months just ended they reached 1,194. In 1903 the houses shown on the approved plans were 2,338, and other buildings 420, while during 1904 the houses numbered 2,324 and other buildings 757.

Shipley.

The year 1904 has been on the whole a moderately prosperous one at Shipley. The stone trade is perhaps the least satisfactory of all branches. A good deal of building has taken place during the year, especially of houses of the semi-detached villa class.

Stockport.

The building trade in Stockport has been greatly depressed during the past year.

Sunderland.

Plans for 478 new buildings were passed last year, which is evidence of the rapid growth of the Wearside borough.

York.

Building diminished considerably during the year. In 1903 there were 238 plans for dwelling-houses approved during the year, as against 194 last year. Of the above dwelling-houses the number completed during 1903 was 328 and 64 during 1904.

Aberdeen.

The number of plans sanctioned was the lowest for many years past, and the trade was depressed.

Dundee.

Trade has experienced one, and the worst, of a succession of lean years. In every department there has been depression and hard times both for masters and men. While the prospects for the ensuing year cannot by any stretch of imagination be described as bright, it is undoubted that a better feeling prevails, and that there is a disposition on the part of the trade to believe that the lowest point in the scale of depression has been touched, and that in the next twelve months the business will show an improvement on the past two or three years.

Leith.

The trade in Leith during the past year was anything but brisk.

Perth.

The building trades in Perth have not suffered to any great extent the severe depression that has been felt in other populous centres.

Edinburgh.

Taking trade union statistics as the basis for estimating employment generally, it is found that the building trade has not been in such a depressed state since after the failure of the City of Glasgow Bank in 1879, when employment of builders touched the lowest point. Throughout the summer there never was less than 25 per cent. of the bricklayers idle. Although the work passed through the Dean of Guild Court during the year has numerically and financially been greater than the previous year, yet the depression in the building trade has been undoubted, and the explanation is partly that about 40 or 50 per cent. of the work passed through the Court has not been in operation, partly owing to the want of purchasers.

Belfast.

The building trade during the year shows some little improvement upon the previous year, although it has still been less satisfactory than could have been wished. In the beginning of the year large contracts were scarce, but afterwards things improved.

PORTLAND CEMENT.—II.

Some Notes on its Manufacture and Testing.

By H. K. G. BAMBER, Managing Director, The Associated Portland Cement Manufacturers (1900), Ltd.

(Concluded from p. 6 of No. 517.)

THE chemistry of Portland cement has been and still remains a very abstruse subject. A considerable amount of research has been made from time to time by various chemists, whose results throw some light on the matter, but there yet remains a wide field of research for the scientist and manufacturer before the whole truth will be known.

The following shows the chemical composition typical of the bulk of cements in use, the sample being taken when fresh ground.

Analysis.

Silica (SiO_2)	22·00
Insoluble residue (sand and insoluble silicates)	·75
Alumina (Al_2O_3)	7·60
Ferric oxide (Fe_2O_3)	3·55
Lime (CaO)	61·90
Magnesia (MgO)	1·25
Sulphuric anhydride (SO_3)	1·50
Carbonic anhydride (CO_2)	·25
Water (H_2O)	·75
Potash (K_2O) Soda (Na_2O) and loss	·45
	100·00

The percentage amounts of the various ingredients will of course be somewhat changed if such cement is subjected to prolonged aëration, when the amounts of carbonic anhydride and water will be found to have much increased by absorption from the atmosphere, with a consequent diminution in the percentage quantities of the other ingredients. For this reason, in cases where the percentage of lime present is fixed by specification, the amount found on analysis should be considered absolutely in conjunction with the amount of matter volatile on ignition, *i.e.*, the water and carbonic anhydride, otherwise it will be clear that an erroneous opinion may easily be formed, leading to a mistaken decision on the quality of the cement, causing annoyance to engineer or consumer and loss to the manufacturer by groundless rejection of the cement.

It frequently happens that disputes arise between the consumer and manufacturer on this point. As an example, a manufacturer prepares some cement to the requirements of a specification which fixes the lime between the maximum and minimum limits of, say, 62 per cent. and 60 per cent. respectively—in addition to other conditions which necessitate the manufacturer working as close to the minimum as possible, say 60·5 per cent. when fresh ground. The cement is prepared in accordance with the specification—delay takes place in the sampling by the engineer—or the sample drawn gets carelessly exposed to atmospheric influence before the analysis is made, with the result that absorption has taken place, the relative percentage of the ingredients is disturbed, and the lime reduced by an absorption of, say, 1·5 per cent. water and carbonic anhydride to 59·59 per cent., and is consequently rejected as being below the minimum allowed, *i.e.*, 60 per cent. For this and for many other reasons that might be cited, where an analysis is specified for any cement, the sample should be taken, if at the works, as soon as possible after the cement is ground, or, if after delivery to the consumer, immediately on arrival; and in either case the sample should when taken be placed in an hermetically sealed receptacle, such as a glass-stoppered bottle, and thus kept free from exposure to the atmosphere till the analysis is made.

Unless such precautions are taken in the case of the sample for analysis, no reliance whatever can be placed on the results of the analysis as representing the composition of the bulk from which such sample was drawn.

It will be foreign to the matter before us to go into the question of methods of analysis, as such matters are not dealt with by the engineer or clerk of works, being delegated to some expert fully acquainted with the proper methods, and whose decision is generally acted upon by the consumer.

For many years the maximum amount of lime permitted by most specifications was 62 per cent., but since the many improvements both in the amalgamation of the raw materials and the more perfect calcination, a larger percentage is advisable, and in cases, as in the rotary process where the clinker is not contaminated with the ash from the kiln, the percentage of lime can be and is beneficially increased up to 64 per cent. in the finished cement. As a matter of fact, 64 per cent. of lime is about the actual percentage in all cement clinker, even when manufactured by the older processes, but during the calcination the ash (chiefly silicates of alumina) from the coke or coal becomes mechanically mixed with the clinker when drawn, and cannot be separated; so that both are ground together, reducing the relative percentage of lime in the finished cement in direct proportion to the amount of silicates of alumina, &c., or ash picked up from the fuel, which in actual practice reduces the percentage of lime from about 64 to 61 per cent., the approximate amount found on analysis in most cements.

The clinker manufactured by the rotary process, as already described, is free from an admixture of fuel ash; and, consequently, although manufactured from raw material of the same composition as used by the older processes, the actual lime present, the whole of which is chemically combined, is presumably though not actually higher than when burned by the older processes, in consequence of the absence of ash mechanically mixed with the old process clinker. No decision, however, can be arrived at as to the quality of cement merely on a chemical analysis, but the data thus obtained is extremely useful in conjunction with results of other tests to be described.

Fineness of Grinding.

As already described, it is customary with a high class of Portland cement to grind to very great fineness as compared to comparatively recent practice, when a cement containing 15 per cent. residue on a 50-mesh sieve (2,500 meshes per square inch) was quite common and considered fine ground.

In ordinary practice to-day the cement is ground so that the whole passes a 50-mesh sieve as just mentioned, but leaving residue as follows:—

50	(2,500 per sq. in.)	trace	per cent. residue.
76	(5,776 ,, ,,)	1 to 2	,, ,,
100	(10,000 ,, ,,)	3 to 5	,, ,,
180	(32,400 ,, ,,)	15 to 20	,, ,,

In making this test, which is purely a mechanical one, care must be taken first to see that the sieve used is made of correct standard wire. It will be readily understood, especially in connection with the very fine sieves, such as the 100 and 180, that the diameter of the wire with which the sieve is woven has an important bearing on the size of the hole: the larger the wire the smaller the hole. If this is not taken into account it will be seen, for instance, that the 100-mesh sieve might really be a finer sieve than the 180 by reason of the larger wire leaving less relative space for the passage of the cement in the 100 than in the 180. The standard usually adopted is that the diameter of the wire for each different sieve shall in each case be equal to half the diameter of the hole—thus for the 76-mesh sieve the diameter of the wire will be ·0044in., corresponding to a total wire width per inch of ·3344in. (76 × ·0044), or one-third of the space—thus each hole with this wire will be twice the width of the latter.

For the 100 (10,000 holes) sieve, diameter of wire ·0032 (100 × ·0032), total width of wire ·32in., as nearly as can be—one-third.

For the 180 (32,400 holes), diameter of wire ·0018in. (180 × ·0018), total width of wire ·324in., again as nearly as possible—one-third.

Sieves of these standards are readily obtainable.

Having a sieve of the correct standard, great care should be taken not to lose any of the residue during shaking, and the operation of shaking should be continued, especially with the finer sieves, until no more residue is coming through, which can be easily seen by sifting over a piece of white paper. The residue is then weighed—not the flour which has passed through, which latter is liable to loss during the operation of sifting.

By continual use, especially if kept in a damp place, the mesh of the wire is likely to become choked with fine cement. More especially is this the case with the finer sieves, in which case, of course, the results are absolutely misleading and incorrect.

Sieves can be cleaned by washing in very dilute hydrochloric acid and afterwards with clean fresh water, and then thoroughly dried.

Most of the disputes from time to time on the question of fineness arise from one or other of these causes, and if the conditions mentioned were followed much friction would be saved.

Specific Gravity.

This test has superseded the "weight per bushel," and is a much more reliable test than the latter. It is not affected by the fineness of grinding, which destroys entirely the value of the weight per bushel test. This test is applied as a measure of the calcination to which the cement has been subjected, as, should there be any considerable proportion of under-burnt or lightly-combined clinker present in the cement, which would be likely to cause unsoundness, the specific gravity would fall below 3·125, which is taken approximately as the standard for well-burnt cement.

This test is also affected, as is the chemical analysis, by exposure to the atmosphere, and in every case the conditions of sampling for the test, as for that for analysis previously described, should be enforced.

As is well known, the specific gravity of a substance denotes the ratio of the weight of any volume of that substance as compared to an equal volume of pure water at its point of maximum density, 4 degs. C. or 39·9 degs. Fahr.

Well-burned fresh cement is 3·125 times heavier than water, but it will be readily understood that if the cement is allowed to combine with varying proportions of water and carbonic anhydride before the specific gravity test is made, there will be a reduction in the relative weight or specific gravity in direct proportion to the amount of absorption. Samples, therefore, should be kept in hermetically sealed vessels.

This test, when required, is usually carried out by the expert engaged to examine and report on the cement, who is of course fully aware of all the conditions under which the test has to be carried out.

When such is not the case, and the test is made at the works, great care must be taken to get reliable results. The method consists of measuring the volume of a given weight of cement in some liquid not affecting the cement. Petroleum free from water is the most convenient medium, but care must be taken to record carefully the temperature of the petroleum and apparatus at the commencement of the operation, and to see that the same temperature is restored before reading the displacement caused by the introduction of the cement. If this is not done, the volume of the cement added to the petroleum will be recorded plus the expansion of the petroleum, or *vice versâ*.

Setting Time.

Here, again, the cement supplied by a manufacturer to a required setting time may vary considerably in the setting characteristics, in accordance with the amount of aëration to which the sample is subjected, and this unavoidable variation due to atmospheric causes is a fruitful source of trade disputes. The cement should, as far as possible, be tested as received.

The method for testing the setting time most in favour is that of the use of a weighted "needle" having a point $\frac{1}{16}$in. square and weighing in all $2\frac{1}{2}$ lbs. The cement is not considered set so long as an appreciable impression is made when the needle is carefully applied to the surface of the pat.

In gauging the pat for this test sufficient water should be used to produce a plastic mass, but care must be taken not to use an excess of water, which would result in a scum on the surface of the pat that would make observation of the real impressions difficult and lead to divergent results.

Many cements, especially those of a slow-setting character, will continue to show faint impressions upon application of the needle long after the actual "setting" has taken place, which will continue until the superficial hardening of the pat prevents any further marking.

In cements of this description experience only can guide one in fixing the point when setting is complete and hardening in progress.

The temperature and humidity of the surrounding atmosphere also plays a not inconsiderable part in the action of the setting of cement. A hot dry atmosphere will tend to more rapid setting. As far as possible a normal temperature of 62 degs. Fahr. and a moist atmosphere should be maintained in the laboratory. Pats should always be made on glass or some other non-absorbent material and kept in such position that undue evaporation of the gauging water is prevented.

Very slow-setting cements frequently show contraction cracks while setting from this cause, the water being evaporated before the chemical action by crystallization is complete, with consequent shrinkage. There is no difficulty, however, in distinguishing between a contraction and an expansion crack. The former, however, is frequently taken for the latter, causing much consternation and unnecessary trouble and anxiety to the consumer and annoyance to the manufacturer, who, having supplied what has been required of him, cannot control the forces of nature. In testing slow-setting cements for setting time it is always advisable to take special precautions against evaporation; the pats when gauged should be covered or placed in some receptacle in which the atmosphere can be kept moist until the setting is complete.

Tensile Strength.

Much has been written from time to time concerning the methods of conducting this test for mechanical strength of cement, but time will not permit of going very closely over the ground.

In the hands of the expert there is little difficulty in conducting the test, but in the hands of the novice the reputution of the manufactured article is everlastingly trembling in the balance.

In the first place it is essential to see that the apparatus and tools to be employed are clean and suitable for the purpose. A mould well greased up or swimming in oil for the purpose of preventing the cement sticking to the mould will often entirely destroy the qualities of the cement placed therein. In filling the mould some quantity of cement, of necessity, falls on and about the same, and as this is always carefully gathered up and packed into the mould to form the briquette the cement so picked up has quantities of oil adhering thereto which thus finds its way into the interior of the briquette and entirely destroys the setting properties of the cement, which, when tested at due dates, fails to comply with the specification.

Care should be taken that moulds are thoroughly clean and free from any excess of lubrication.

Neat Briquettes.

Neat cement for this test should always be taken in weighed quantities, and the water, thoroughly clean, always measured so that a record is available of the proportions constituting the briquette.

Briquettes should always be made singly, especially when the cement is quick-setting. The custom of gauging enough cement at one time to fill several moulds is very objectionable and frequently leads to most unreliable results — the first briquette, and perhaps the second, turn out all right, but the remainder fall short of the required strength, because, forsooth, the cement had commenced to set before the briquettes were finished. The setting of the cement having been thus broken up, the chemical action due to setting is never again thoroughly complete. Again, it is objectionable to use nests of moulds, say four or six, as is frequently done, even if the briquettes are gauged singly, as with a moderately quick-setting cement in the hands of the inexperienced the packing of the last briquette disturbs by vibration the setting of the first of the series, which may have already commenced to set. Again failure—but this time of the first instead of the last briquettes made.

Each mould should be quite separate and distinct, and when filled should be placed where no vibration can disturb it.

Only slow-setting cements escape failure under these two headings in the hand of the inexperienced.

All briquettes, whether neat or with sand, when first gauged should remain in the mould for twenty-four hours and be kept in a damp atmosphere during the whole of that time. They are then carefully removed for immersion in water, in accordance with the requirements of the specification.

The quantity of water to be used for gauging should be that quantity which will produce a plastic condition when the cement is packed in the mould, but care should be taken that the cement is kept in the form of a damp powder until packed into the mould, when slight tapping will so consolidate it as to render it plastic. If the cement is trowelled into a plastic mass before placing in the mould, the air bubbles in the mixture cannot be excluded and a briquette full of air-spaces will result. If packed into a mould, however, in the form of a damp powder, the air escapes before plasticity is reached, and a solid and homogeneous briquette is the result.

The quantity of water ranges from 18 per cent. to 22 per cent., in accordance with the fineness and setting properties of the cement under test, and a trial should be made with one or two briquettes to discover the most suitable quantity of water, which, if not satisfactory, should not be included in the series from which the test records are to be made.

Sand Tests.

For "sand tests" none but the Standard Leighton Buzzard testing sand should be used. This material is readily obtainable and is of such fineness that all passes a 20^2-mesh sieve (400 holes per sq. in.) and is retained on a 30^2-mesh sieve (900 holes per sq. in.). Before use this sand should be tested as to its behaviour on sieves of this description, so that any coarse particles or fine powder may be eliminated.

All the precautions recommended for the making of neat briquettes apply equally when making briquettes containing three or any other number of parts of sand to 1 part of cement. The quantities should always be taken by weight and not by measure. The percentage of water most suitable ranges from 8 to 10 per cent. of the weight of the dry mixture.

The briquettes during immersion should be kept as nearly as possible at an even temperature; great extremes should be avoided.

Briquettes should be broken at the due dates immediately after being taken from the water, and should not be left about to dry before being tested.

Whatever form of breaking machine is used care should be taken that the briquette is placed evenly and squarely in the clips, so that when the strain is applied the pull is even on all parts of the square-inch section and no side strains are set up, the latter resulting in defective fracture and irregular results.

It is important also that the strain should be applied evenly and at a uniform rate. The standard usually adopted provides for the application of the strain at the rate of 400 lbs. per minute: very irregular results will be obtained if care is not taken in this particular.

An average of results of five briquettes, both in the case of neat and sand tests, are usually sufficient for conclusions to be arrived at as to tensile strength. The results, however, of any apparently faulty briquette giving exceptionally low results should be eliminated, as it is evident the fault must be due to manipulation, as, whatever strain the average number of briquettes of the series may be capable of standing, all should do under like conditions.

Soundness.

A great deal has been written under this head, and much useful information is obtainable from works of reference treating the subject of Portland cement. The test is of, perhaps, more importance than any other test to which cement is subjected.

Portland cement used as a constructive material takes a long time to arrive at its maximum strength, and sometimes long intervals elapse after use before defects, if any, begin to show themselves.

The tests for soundness consist chiefly of exposing a set cement to various high temperatures in water, in order to hasten the ultimate results likely to be obtained under various climatic conditions.

Boiling Test.

Many tests of a more or less stringent character have been introduced, the most severe being the boiling test. There are various methods of carrying out this test, but the most rational and severe is that known as the Le Chatelier method.

The apparatus for conducting the Le Chatelier tests consists of a small split cylinder of spring brass or other suitable metal, 30 millimetres internal diameter and 30 millimetres high, forming the mould to which on either side of the split are attached two indicators 165 millimetres long from the centre of the cylinder.

In conducting the test the mould is placed upon a small piece of glass and filled with cement gauged up in the usual way, care being taken to keep the end of the moulds gently together while this operation is being performed. The mould is then covered with another glass plate; a small weight is placed on this and the mould is immediately placed in water at 58 to 64 degs. Fahr., and left there for twenty-four hours.

The distance separating the indicator points is then measured and the mould placed in cold water, which is brought to the boil in fifteen to thirty minutes and kept boiling for six hours. After cooling, the distance between the points is again measured: the difference between the two measurements represents the expansion of the cement, which must not exceed 10 millimetres after the cement has been aërated for a period of seven days.

This is the most stringent test for soundness in use and has an advantage over all other tests, which only record expansion without any means of measuring the amount of same. It errs, however, on the side of severity, as thousands of tons of cement manufactured in the past—which have resulted in splendid work—and much cement that may be manufactured in the future, which may also do good work, would fail to pass this most stringent test.

Cement, however, that will pass this test will pass any other of the many hot tests known to the trade, and must of necessity be of a high-class character, thoroughly well manufactured and such that will give satisfaction under any normal conditions. It is cement of such description which is the aim of the British manufacturer to produce.

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At the conclusion of the foregoing paper a discussion took place and Mr. Bamber replied to a number of questions put to him by members of the Association. He pointed out how in the case of the ball mill the material was crushed between the rolling balls, the crushed material passing through the perforated plate which carried the balls on to a protecting sieve through which that portion fine enough passed to the final sieve on the periphery of the mill, the quantity fine enough to pass this latter sieve being thrown by the action of the mill into the hopper in which the mill was enclosed, from which it was conveyed automatically to the tube mill for final grinding; the residue which passed through the perforated plates, and was not sufficiently finely ground to find its way through the external sieve, being returned automatically for regrinding. The tube mill was not set on an incline but perfectly level; the outlet for the finished cement was lower than the inlet for the cement being received from the ball mill, and the action of the stones as the tube mill rotated prevented the cement (which was introduced into the mill by means of a feed screw) from heaping up at the point of inlet, the rotation of the mill and the rolling of the pebbles causing the cement fed into the tube to find its way through the interstices between the stones and the grinding plate to the outlet end of the mill, the cement in its passage from point to point (a distance of about 26ft.) being subjected to the attrition between the stones and the lining of the tube mill, and reaching the outlet end in a condition of fineness as desired—any variation of fineness that might be required being obtained by regulation of feed delivered to the mill for grinding. With regard to wastage of the pebbles and the effect they might have on the cement, Mr. Bamber said the wear in this respect was infinitesimal.

In reply to a question with respect to the mixing of the raw materials, Mr. Bamber said it was found preferable to use all chalk by measure and clay by weight (both in trucks).

In reply to questions as to a ready or rule-of-thumb method that a clerk of works might adopt to form a fairly accurate opinion as to the quality of cement required for immediate use, Mr. Bamber said that under like circumstances he would turn his particular attention to three points: (1) Immediately on receipt of the cement on the work he would test it for fineness (purely a simple mechanical operation); (2) setting time, following the method described in the paper; and (3) he would submit one or more of the pats twenty-four hours after being made to hot water test, placing them in any convenient receptacle in cold water, bringing the water gradually up to a temperature of 180 degs. Fahr., or thereabouts, and maintaining that temperature for three to four hours, and if the cement was sound under these conditions he would feel perfectly satisfied that it would give reliable results in the work. Having satisfied himself on these three points, he would give special attention to the quality and condition of the material which he was going to mix with the cement, as it frequently happened that faulty work was due rather to the material mixed with the cement than to any peculiar property which the cement might be alleged to contain.

THE GERMAN CEMENT INDUSTRY.

Report from the British Consul-General at Hamburg.

SIR WILLIAM WARD, British Consul-General at Hamburg, has sent home a very interesting memorandum on the German cement industry, which the Foreign Office published on Thursday. Sir William states that no other branch of trade in the country has expanded so rapidly, nor has there been one in which has occurred so much over-production. The first factory was only established in 1852, and the second and third did not appear till 1854. Thereafter works sprang up rapidly, until in 1882 the number was 420, and thirteen years later 1,274. No official statistics have been issued since 1895, but there has been no falling off in the increase of factories since that time. The production of cement was about 4,200 tons in the early 'fifties, increased to 509,200 tons in 1882, to 2,070,400 tons in 1895, and is now estimated at 5,000,000 tons annually.

More than one-fourth of the exports go to the United States, but the market there is diminishing, as America is fast becoming able to supply its own needs. The next largest customer is Holland; British South Africa third and the United Kingdom fourth, the annual consignments here being about 37,000 tons.

"During the first years of the existence of the German cement industry," remarks Sir William, "the German product had considerable difficulty in competing in Germany itself with British cement, owing to the cheaper prices of the latter, which in many instances was able to be transported at lower rates of carriage from the United Kingdom to inland German markets than were charged for transporting the German cement to such markets from the locality where it was produced. It was, moreover, at first difficult for the German manufacturer to convince the public in this country that many kinds of German cement were quite equal in quality to British. Gradually, however, the disinclination of the German consumer to use the home product disappeared, whilst the German cement works managed, by improving their methods of manufacture, and by erecting works in localities more favourably situated as regards water communication, to reduce their prices, and German cement was not only more and more used in this country itself, but it gradually became also an important article of export from Germany, and entered into serious competition with British cement in most foreign countries, and to a certain extent even in the United Kingdom itself."

Up to the end of 1900 the German industry, despite the excessive production, was very profitable, and the average dividend paid in 1899 by the larger works was 17 per cent. This prosperity was principally due to the existence of the trust, which was a combination of eight syndicated groups, and was able to largely control prices. The collapse of the trust came about through the breaking away of several of the syndicates. All efforts to reconstitute the trust have hitherto failed, one of the reasons urged by some of the companies against the maintenance of a high level of prices being that the best way to bring about a healthy condition of the trade is to bankrupt the undertakings that are financially unsound, by keeping prices ruinously low. The British Consul does not think such a policy can be carried out for any length of time without disastrous consequences for all concerned, and he adds that the fierce competition of the last few years would not have been possible but for the immense stocks in hand, the result of previous over-production. Some idea of the drop in prices can be obtained from the fact that since 1899, whilst the quantity of exports has increased 28 per cent., the value has declined 33 per cent. Very small profits have been earned by manufacturers during the last few years. Yet, although home and foreign consumption is unable to absorb the large stocks still in existence, new factories continue to be built.

Builders' Notes.

The Accepted Tender for Hull's New Public Hall—construction of basement and shops of second portion—is that of Mr. G. H. Panton, his price being £15,269.

Messrs. John Pickles & Son, engineers, have moved to new works at Mytholm, Hebden Bridge, which have been constructed and equipped to meet the increasing demand for the firm's improved sawmill and woodworking machinery.

Messrs. Rottmann & Co., of 25 and 26, Garlick Hill, Queen Victoria Street, E.C., manufacturers of Japanese leather papers and English wallpapers, have just opened West-End show-rooms at 29, Mortimer Street, W. The City address, however, will continue to be the head-office and warehouse.

New York Building Trade: Declaration.—The constitution of the new Associated Building Trades of New York and vicinity declares it shall be "the special duty of this body to use the united strength of all trades represented herein to compel all non-union men to conform to and obey the laws of the trade to which they should properly belong, and if necessary all affiliated trades shall, on a two-thirds vote of the body, cease work; any trade refusing to comply shall be fined 500 dollars (£100)."

Manchester School of Technology: Award in favour of the Builders.—Sir William Emerson, the arbitrator appointed to settle differences existing between Messrs. Robert Neill & Sons, builders, of Manchester, and the Manchester Corporation, which had arisen in connection with the erection of the School of Technology, has directed that the Corporation shall pay to Messrs. Neill the sum of £19,920, which sum was to be a full satisfaction of their claims, the Corporation to pay their own costs and also the costs of Messrs. Neill, which were to be taxed. Sir William Emerson also awarded and fixed his own fees and costs, including the fees of Mr. Young, a London quantity surveyor, at the sum of £988, and directed that such sum should also be paid by the Corporation.

Obituary.

Mr J. H. Reed, joiner and contractor, of Carlisle, died on January 2nd.

Mr. Robert McCracken, a Belfast builder and contractor, fell from a scaffolding in Dublin on January 5th, and sustained fatal injuries.

Mr. Edward Tidman, hon. secretary of the Sanitary Inspectors' Association, died on January 3rd and was buried on Saturday last.

Mr. R. C. Else, who died recently at Bristol, aged 81, was an engineer, and was associated with Mr. Brunel in the construction of the Bristol and Exeter Railway and the Saltash Bridge.

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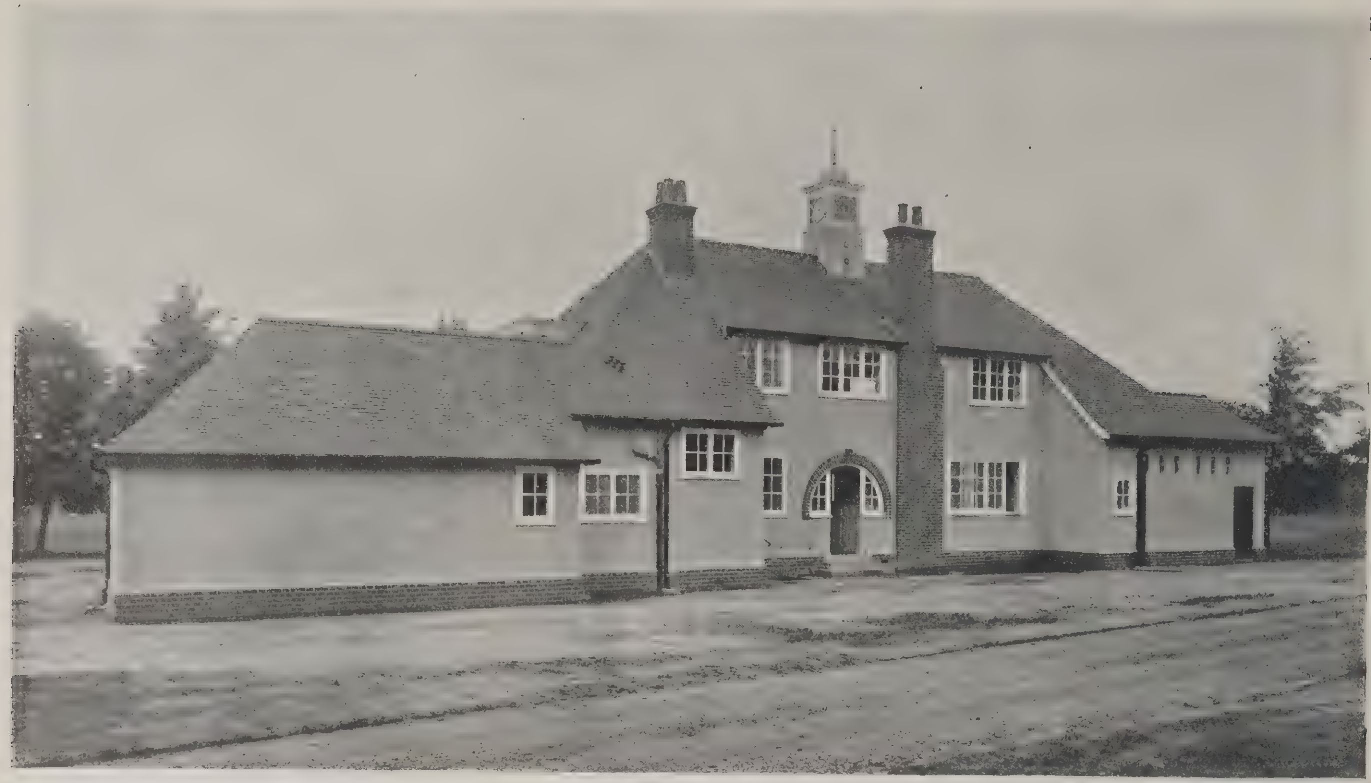
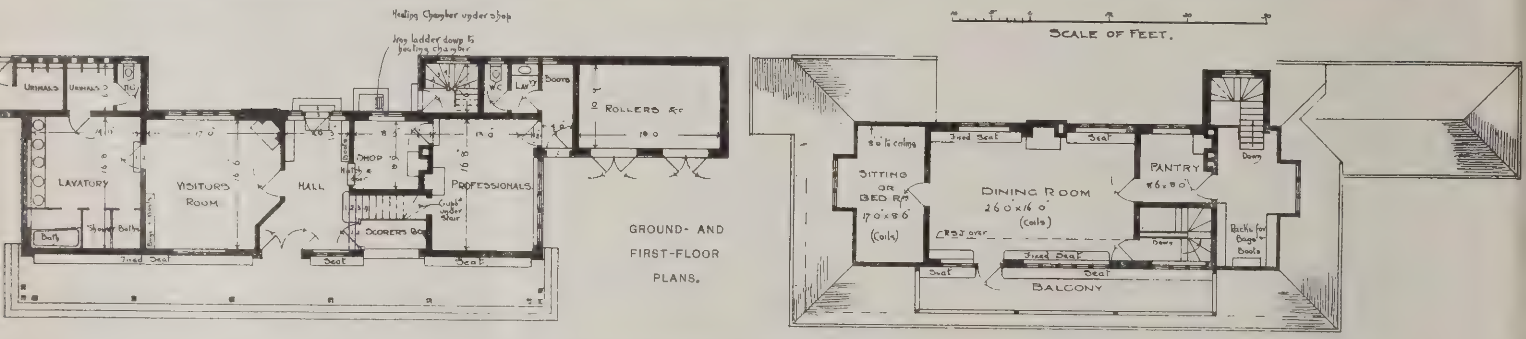
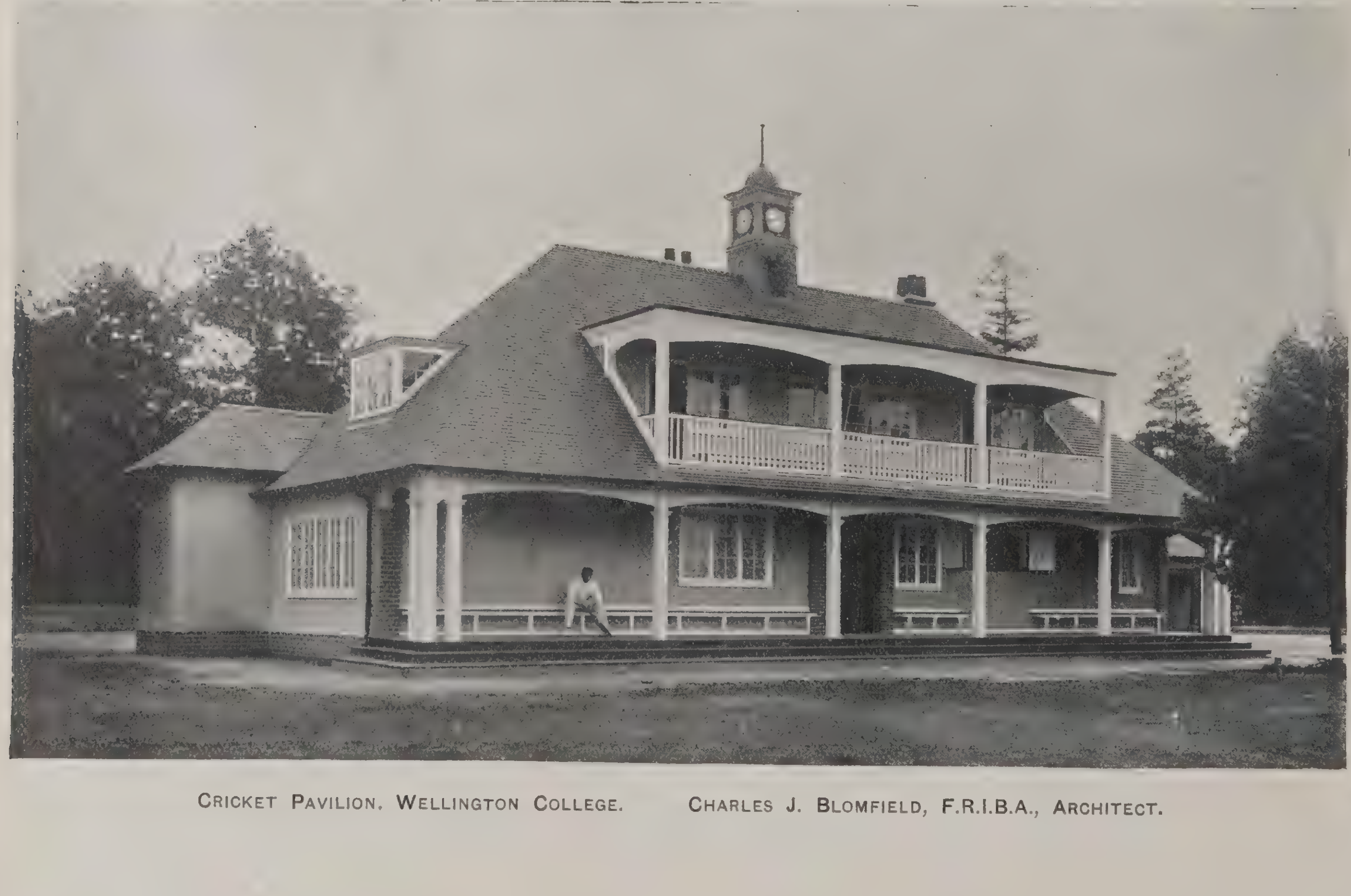
Supplement to
The Builders' Journal and Architectural Record,
Wednesday, January 11th, 1905.





GROUND- AND
FIRST-FLOOR
PLANS.



Cricket Pavilion, Wellington College. Charles J. Blomfield, F.R.I.B.A., Architect.

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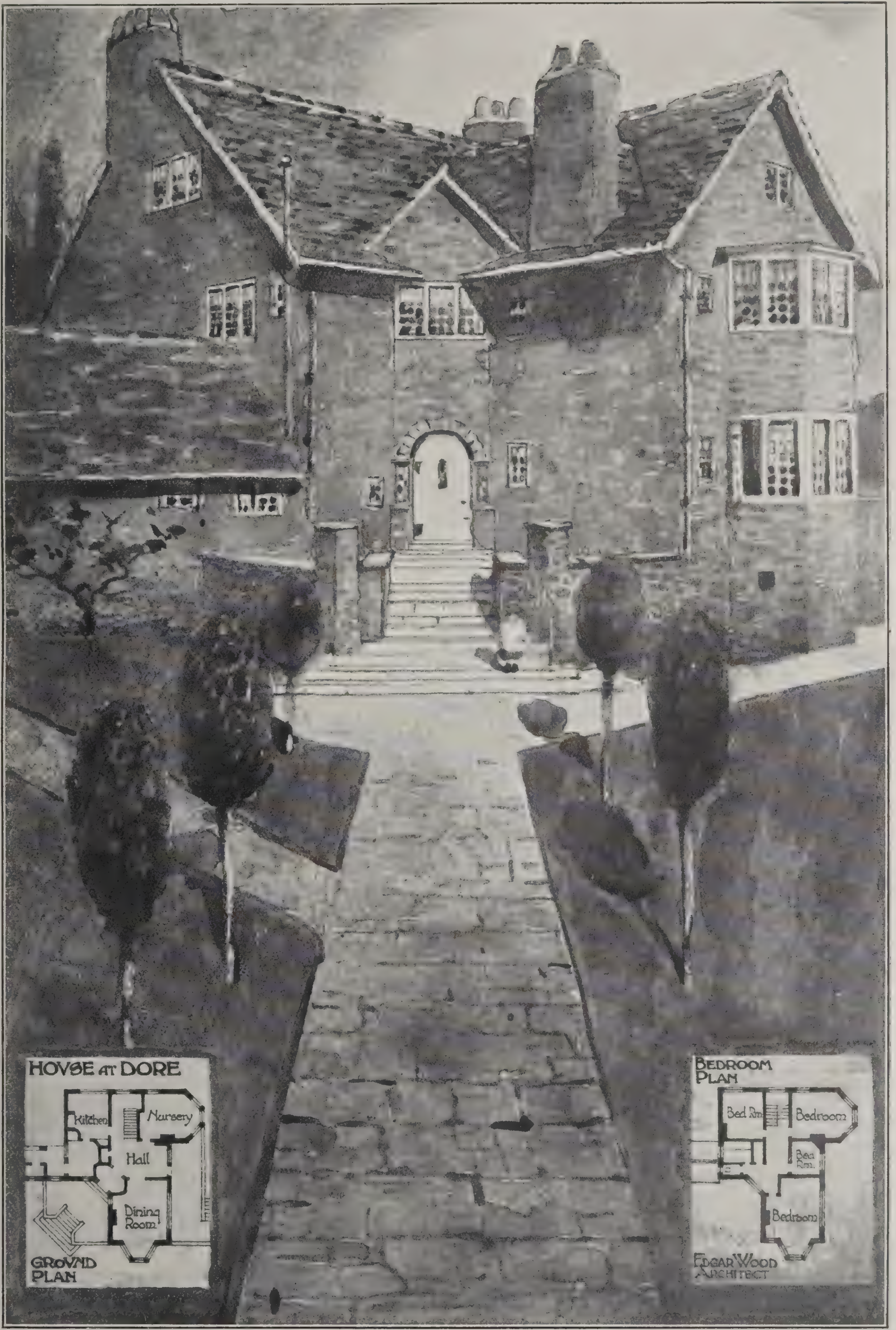

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QUANTITY SURVEYING IN THE TRANSVAAL.

THE following notes on modes of measurement in the Transvaal will be of terest to English quantity surveyors:—

Brickwork.

This is measured per yard super., and each ickness is kept separate. Openings are not ually deducted, but no fixed rule exists, d it is therefore best to state what is done ith regard to openings. The Public Works epartment issues quantities with brickwork yards cube measured nett, all openings ing deducted.

Floors.

In English practice, of course, floors are easured in the various items of plates, joists, oring, &c. The custom in the Transvaal is to easure wood floors in squares super., including everything, sometimes even sleeper walls. he sizes of plates, joists, spacing, &c., are ven under the one head. The Government antity surveyors measure these items in the ual London way, except that timbers are lled in lineal feet under the several sizes, d notes follow framed and unframed mbers, thus :—

(NOTE.—The above equals cubic feet.)

In taking dimensions all timbers are taken feet, anything less than 1ft. being taken 1ft. Thus, floor joists 12ft. 3ins. long ould be measured 13ft. each, and so on. his applies to all timbers.

Roofs.

Slates and steel or wood shingles are casionally used for roofs, but the usual ofing material is corrugated iron, and with is covering timbers are very much lighter an in English practice. Except for zinc ts, boarding is rarely used. Roofing papers e sometimes employed. The timbers are ther screwed, spiked or bolted, and very ttle "framing" is done in ordinary work. he local custom is to measure roofing per uare complete, including timbers, coverings, ridges, hips, &c., stating the sizes of nbers, distance apart of trusses (there are "common rafters"), description of coverg, &c. The Government quantity suryors measure the work in the London way, lling the roofing iron in squares super., easured nett. and the ridges, hips and lleys in lineal feet, also nett. Allowances e made of 6ins. to abutments for cutting d 1ft. to valleys and hips. The roofs are quently painted with oxide paint, and in easuring this paintwork one-third should added for laps (in good work), as on an erage the laps take practically one-third a sheet of iron and should be painted fore fixing. The timbers are measured as scribed under "floors." Ridge-pieces are t absolutely necessary, though they are metimes used. Hips and valleys should ve fillets (or hip or valley purlins) on ch side. Eaves-gutters, &c., are measured the ordinary way.

Joinery.

Imported joinery is very largely used, "purse-made" work being expensive. Imported irtings, cornices and architraves are largely ployed. These are measured in lineal feet, cluding mitres, &c., and all grounds (if y). There are several sizes of imported ndows and doors, including casement shes, ordinary cased-frames and sashes, ench casements, four-panel doors, glazed ors, &c.

Imported windows and glazed doors are azed before importation. In local practice ese items are all numbered, including all mes, glass, &c., and generally all sash steners, lifts, &c. It is necessary to know ich are and which are not imported signs and sizes in doors and windows, and keep "imported" separate from "purposede." The Government quantity surveyors mber all doors and windows, but do not clude door frames and glass (if "purpose-made") or ironmongery, all of which are measured as in London.

Generally.

The general idea in quantities in the Transvaal seems to be to get in a sufficiency of "inclusive" items. "No. 1 chimney breast and stack" or "No. 1 French casement 4ft. by 7ft." (including everything) are specimens of items one sometimes sees. The quantities issued by the Government are gradually training local builders to price work more in accordance with London practice, and before very long they may have a beneficial effect on the work issued by private surveyors. As elsewhere, builders are alive to their own interests, and it is scarcely to be doubted that good quantities will assist them in the Transvaal as much as they do in the "Old Country." They will soon expect private surveyors to give them the same help (by giving them good quantities) as is given them when they tender for Government work.

A. BELL-JOHN.

OUR PLATES.

THE cricket pavilion at Wellington College, erected recently from the designs of Mr. Charles J. Blomfield, F.R.I.B.A., of London, by Messrs. J. Dorey & Co., of Brentford, consists on the ground floor of a large visitors' changing room connected with lavatory, bathroom, shower baths, &c. The chief portion of the other end of the building is devoted to the professionals' use, and consists of a mess-room, lavatory and shop, the last having a hatch opening into the entrance hall. Access to the scorer's box is also obtained from the hall. Beyond the professionals' room is a large out-building for the accommodation of grass mowers, rollers and other plant. A verandah runs the entire length of the building facing the field, the level of this being the same as that of the ground floor, namely, about 18ins. above the ground level. On the first floor is a large dining room, through which access is obtained to the balcony, which extends over a portion of the verandah. There is a small second room on this floor and also a scullery. Ample space is allowed for cricket-bag stands. A heating chamber is provided in the basement, the hot water being supplied therefrom to the lavatories and to a complete system of heating by coils This has been done in order that the building may be available for use other than a cricket pavilion during the winter months. The walls have been carried up in brick, covered with rough-cast, and the roof is tiled. A small clock turret is placed in the centre bearing the college arms on the lower portion of the turret facing the field. It is proposed to panel the dining-room in oak and to record thereon the cricket elevens and football fifteens of former years.

The house at Dore is on a very steep and exposed site, from which the stone used in its erection was obtained. The windows are of wood painted white; the roof covered with stone slates. The dining-room, hall and nursery were to face the sun, and the approach to the front door was to be convenient to the road and not to disturb the garden, which is on the sun side. This has resulted in the front door being placed in the angle. Mr. Edgar Wood, of Manchester, was the architect.

The block of business premises in Tooley Street, London, S.E., was completed last year from the designs of Mr. C. Stanley Peach, F.R.I.B.A., of 28, Victoria Street, S.W.

A Tower 1,500ft. High has been designed by Professor Despradelle, instructor in architecture at the Massachusetts Institute of Technology. It is intended for New York and will contain auditoriums, entertainment halls, &c.

THE TIMBER TRADE.

The London Market in 1904.

MESSRS. CHURCHILL & SIM, the large timber brokers, report that the importation of wood into the United Kingdom during 1904, as computed by the Board of Trade, has been smaller than in its immediate predecessors, but works out to nearly the average of the six years 1898-1903. Values have fallen heavily during 1904, and the totals given on the next page are less than those of any of the five previous years. The year's trade has been differentiated from that of any of its recent forerunners by the fact that the course of prices has been dictated throughout by what buyers and importers in the consuming markets were willing to give rather than by what owners and shippers in the exporting countries were wishful to obtain; and while this has made the year one of great disappointment to all sellers, it has nevertheless not by any means resulted in an all-round profit to buyers, inasmuch as with a diminishing outlet and falling prices they have constantly been left with stock too expensive for the requirements and opportunities of their retail customers. Up to Christmas-time in 1903 shippers were making very hopeful progress with sales for forward delivery at about their own ideas of value, and, in spite of much talk of bad trade, their buyers were discriminating rather as to what specification they would speculate in than making much serious objection to the rates they were being asked to pay. Business was broken off for the holidays, and directly the attempt was made to resume it in January, 1904, it was apparent that a change had passed over the scene. The results of the year's trade in 1903 had not been satisfactory; it had not been possible to reap a fair profit on the prices paid to shippers in that year. On all hands the prospects for a worse year's consumption in 1904 were becoming more evident. "Why hurry to pay these prices again? we will wait"—this was the tone which met all the attempts of the agents to resume selling, and waiting became the order of the day accordingly. This quiescent attitude was maintained on both sides throughout January and February, but meanwhile consumption was falling off here and prices for stocks in this country were shrinking. In March the Swedish shippers made fruitless attempts to meet the situation with lower quotations, which only increased the depression, Russian shippers meanwhile continuing to hold obstinately for hopeless rates, bound together by a combination among themselves which eventually cost them dear. In April they lowered these quotations by over 20s. per standard, and the Swedes again reduced their ideas to meet the competition, but buyers still refused to operate for more than pressing requirements, and these were small. May passed away with prices constantly reducing, and business confined within the narrowest limits. In June more courage became visible and here and there larger sales were possible, when sellers would go below the cheap level to which prices had by that time fallen. A note of hope was sounded, moreover, as to the position for the second half of the year. It was still hope deferred, however, through the holiday months of July and August, very cheap selling being resorted to under pressure of financial and other necessities, and it was not until the serious resumption of business in September and October that it was realized that the necessary selling for the year was being accomplished and that prices had been driven low enough and would go no lower. With that position the year closed, the recovery in the last two months having been infinitesimal, although quite apparent, while business for 1905 has still to open, no definite progress having yet been made towards

Wood Imported into the United Kingdom in the following years:—

		1900.	1901.	1902.	1903.	1904.
Colonial Deals, Battens, &c. - -	Loads	1,688,033	1,517,194	1,639,668	1,507,530	1,280,598
,, Timber and Hardwoods -	,,	113,843	90,042	78,917	66,559	51,798
Foreign Deals, Battens and Boards -	,,	4,945,248	4,763,766	5,037,058	5,233,577	4,785,564
,, Timber and Hardwoods -	,,	3,007,283	2,682,868	2,732,078	3,170,956	3,056,140
Colonial and Foreign Staves - -	,,	145,279	140,064	120,019	129,942	132,178
Total, in Loads -		9,899,686	9,193,934	9,607,740	10.108,564	9,306,278
Value - - - -		£25,873,564	£22,501,010	£23,277,114	£25,137,525	£21,592,844

carrying the problems for the coming season beyond the regions of speculation.

The prospects for the wood trade in 1905 are more difficult to write of than usual at this time of year, in consequence of the unpreparedness of buyers to discuss fresh business at present, and the recognition by sellers that it is unwise to press such discussion prematurely. Data are therefore wanting on which to base any accurate forecast, and material for judgment can only be drawn by analogy from what has gone before. Taking first the probabilities of supply in 1905 from the great wood-producing countries, there seems reason to suppose that the shipments from Sweden may be roundly identical with those of 1904. More than usual has probably been held over from the past season, but there is less inducement than for a long time past in the range of prices to induce fresh production. From Russia also the shipments for 1905 may be fairly reckoned on as likely to be similar to those in 1904. Again, the stocks held over are probably large, but the uncertainties and difficulties in the way of the exporting merchants in making their arrangements for the future are great and are already operating in the direction of a probable hindrance of shipments for 1906. With this in their minds, Russian shippers are not likely to press off 1905 shipments with undue haste. From Canada the shipments in 1905 are likely enough to be restricted and intercepted by the great demands of the still growing prosperity of the American States; while from other sources supplies may be taken as normal, and therefore unimportant. Turning now to the even more vital subject of the consumption for 1905, there are some encouraging signs on the horizon. The Board of Trade returns of the general trade of this country have been unmistakably hopeful during the past autumn, and in the wood trade itself all the depression and gloom of failing trade and falling prices, with no good prospect ahead, which have been characteristic of 1904, must have told with even undue force against the consumption of that year; so that starting fresh in 1905 from the lowest point, and with Hope again at the helm, it is reasonable to expect some reaction of feeling and some expansion of trade. Almost the chief difficuly in 1904 has been to find markets for 3in. by 9in. and 3in. by 11in. deals, in the absence, on any such scale as in former years, of the demand for them from the Cape market. The Cape demand may not be good in 1905, but it seems reasonable to expect that it may be better than it has been in 1904, and, if so, this will impart a definite element of strength to markets generally. Gathering up the probabilities, they seem rather to point to the birth and growth of a general but quite moderate recovery both in trade and prices during 1905, which must be nursed and sympathized with by shippers as a plant easily crushed altogether by harsh or unwise treatment.

From the figures here given the falling off in the consumption and distribution of wood through the London area as compared with recent years is very clearly seen. The estimated consumption is the smallest since 1900. The deliveries from the docks of deals and battens are the smallest since 1896, of boards the smallest since 1900, and of timber the smallest which we have ever known; and these figures are very significant of the trend of last year's trade. The overside deliveries are also below the average of recent years, and the whole series give rise to rather far-reaching misgivings as to the extent to which the London trade can continue profitably to pass the great stream of supply through the port into an area now unduly and increasingly circumscribed in comparison with its population by competition with more lightly charged ports.

Estimated Consumption of London.

	Deals, Battens, Boards and Ends.	Timber, Sleepers and Spars.
1899 - -	60,154,000 pieces	200,500 loads.
1900 - -	55,359,000 ,,	190,900 ,,
1901 - -	60,154,000 ,,	253,900 ,,
1902 - -	60,720,000 ,,	220,600 ,,
1903 - -	59,271,000 ,,	256,200 ,,
1904 - -	57,084,000 ,,	214,100 ,,

Deliveries from the docks in London in the following years.

	Deals and Battens. Petersburg Standards.	Boards. Petersburg Standards.	Loads of Timber.
1899 - - -	169,603	50,486	79,706
1900 - - -	148,648	48,529	71,367
1901 - - -	185,937	55,976	89,369
1902 - - -	167,466	57,355	81,594
1903 - - -	152,380	52,178	78,267
1904 - - -	143,166	49,290	68,308

Deliveries direct from ship to craft of deals, battens and boards.

1899 - - - - -	152,681 P.S.H.
1900 - - - - -	140,131 ,,
1901 - - - - -	134,367 ,,
1902 - - - - -	135,489 ,,
1903 - - - - -	146,597 ,,
1904 - - - - -	135,644 ,,

As regards Hardwoods.

Messrs. Foy, Morgan & Co. report that the mahogany market during 1904 has pursued a very steady course, and although it has had to bear its share of the general slackness of trade it has escaped the violent fluctuations to which some branches of trade have been subjected. The total quantity of mahogany of all kinds imported into London during the year has been several thousand tons more than in 1903, but the total nevertheless remains at a very moderate figure. During the first few months prices for small and medium sized logs gradually declined until they were about 20 per cent. lower than at the end of 1903. This reduction was brought about almost entirely in consequence of the excessive quantity of small and medium sized Cuba logs that was brought into the market. Prices for sound logs of good sizes have remained steady throughout the year with very little fluctuation. During the last three months the importations have been very moderate for the time of year, and prices of small and medium sized logs have risen, though up to the present they have not quite recovered all the ground lost in the early part of the year. The unexpectedly quiet time experienced in the cabinet trade has influenced prices adversely and the slackness of building operations has also had its effect. Considering the dullness of business generally, the mahogany trade has held its own very well through what has been an unusually trying season. At the present time the importations are somewhat below the average for the time of year and a little increase in demand would quickly effect a rise in values.

Cedar.—At the commencement of the yea prices were at a fair level and stocks moderate but the box-making trade throughout Europ generally was not very brisk. Consumer had anticipated their requirements for th first six months of the year by purchasin cargoes afloat and for shipment; but, unfortunately, shippers were not content wit the quantities thus sold, and they sent furthe consignments upon the market, with th result that prices gradually declined unt they were about 12 per cent. below the figure at the end of 1903. Shipments were curtailed during the summer in consequenc of values having reached an unremunerativ level, with the result that during the autum the market began to assume a more health tone. The rate of consumption did n materially increase, but in the face of ver light importations stocks were reduced to more moderate level.

The importations of mahogany and ceda into London during 1903 and 1904 hav been as shown by the table at the bottom this page.

American Hardwoods.

Whitewood.—Some accumulation of supplies, combined with the general dulness trade, caused a considerable fall from th high prices which had been current in 190 Latterly, however, a more regular busine has been done at fair prices.

Oak.—Quartered oak has been in le demand, and although the supply has bee by no means excessive there has been decline from the high prices which we current a year ago. Plain sawn oak plan were too heavily shipped and could only sold at reduced prices. Boards were not much affected, and stocks having now bee reduced, prices are well maintained.

Maple Flooring.—There is little change report concerning the trade in this artic during 1904. The amount of business do has not differed materially from that of t previous year. Prices for the first-class pr ductions have remained stationary, but so inferior qualities have been placed upon t market at reduced figures, and have secur a share of the trade where high grade materi is not absolutely demanded.

East India Teak.

Logs.—Supplies throughout the year ha been scarce, the landings in London bei the smallest for many years. In spite of t fact, prices were slightly easier during t first few months on account of the absence demand. The total amount of trade exhib a considerable shrinkage in quantity co pared with previous years.

Planks.—The market continued steady the spring, chiefly because supplies ca forward so sparingly, but the demand w very weak in the summer and prices droop Towards the end of the year there was m life in the demand, coupled with an alm complete cessation of supplies, causing pri to recover and finally to advance to highest point obtained during the year.

The following figures show the quantit of teak landed and delivered at the Lond docks during the years 1903 and 1904:—

	1904.	1903.
Landed - - - -	7,460	13,859 loads.
Delivered - - - -	9,701	11,121 ,,
Stock on 31st December -	8,559	10,870 ,,

(Overside deliveries for coast ports and the Continent are not included).

Australian Hardwoods.

Jarrah.—The stock of paving sizes on spot was excessive at the beginning of

—	Mahogany.							Cedar.			
	Honduras.	Mexico.	Cuba.	St. Domingo.	Africa.	Sundry.	Total.	Honduras.	Mexico.	Sundry.	To
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	To
1903	5,554	2,147	7,150	40	9,870	25	24,786	66	171	500	7
1904	7,481	5,406	11,474	21	8,654	381	33,417	145	234	776	1,1

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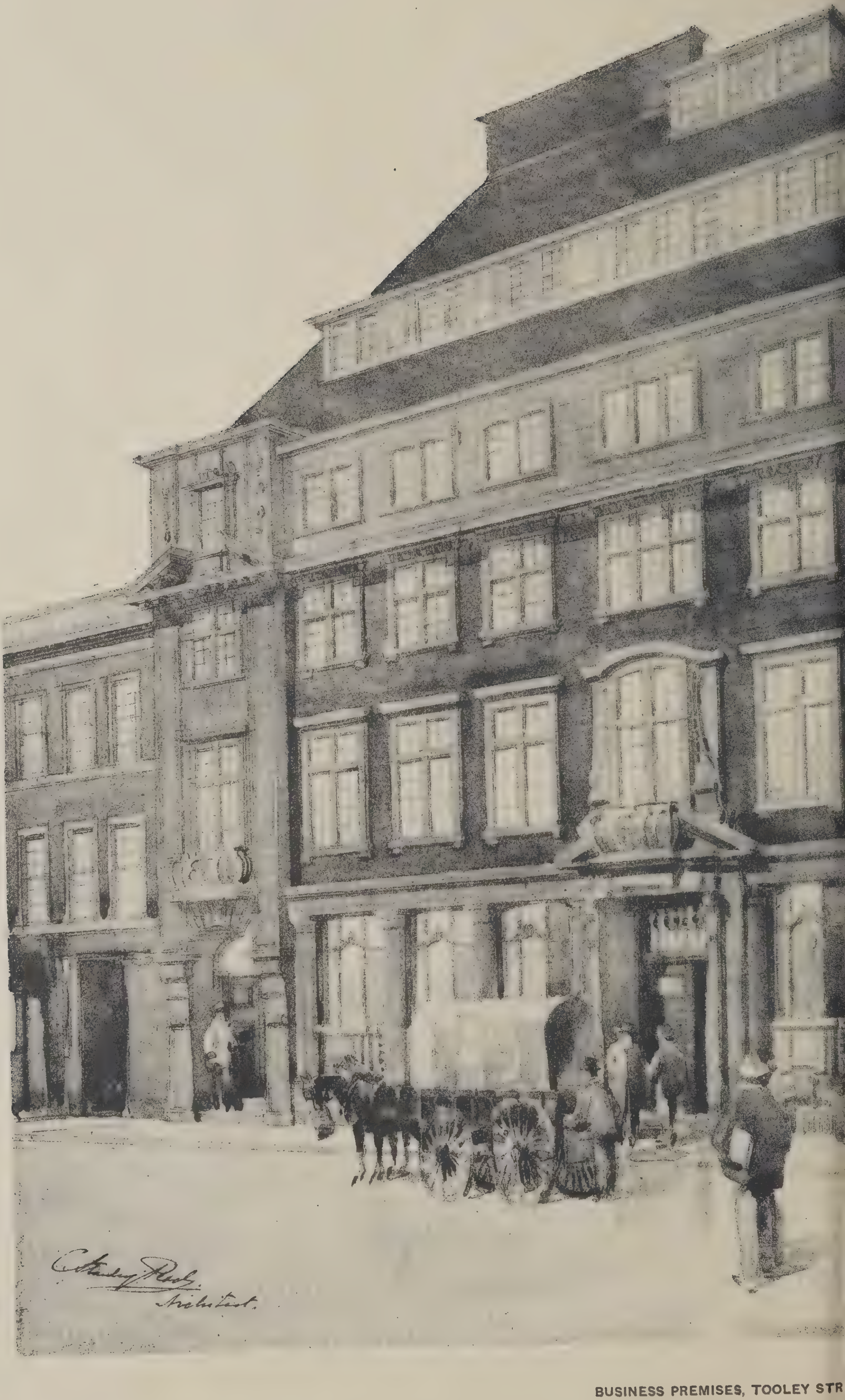
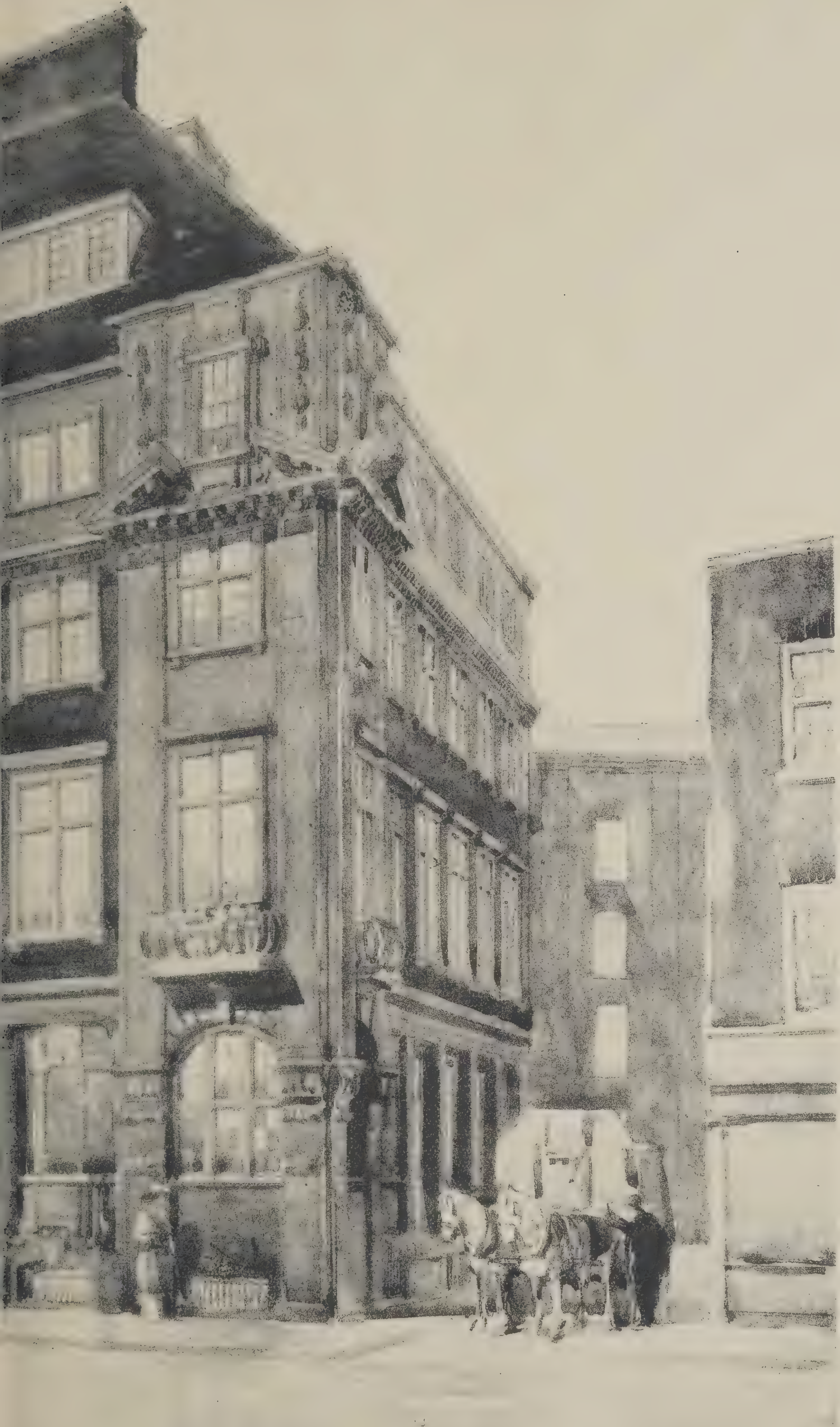


BUSINESS PREMISES, TOOLEY STR



SPOTTISWOODE & Cº Ltd LITH. LONDON.

TANLEY PEACH, F.R.I.B.A., ARCHITECT.

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ar, and prices gradually declined. Fresh rivals were more than sufficient for the rrent demand during the first half of the ar and finally led to some sales at very low ices. The market has remained weak in ew of the abundant supplies avilable, and likely to continue in the same unsatis- ctory condition until shipments are better gulated to the requirements of consumers.

Karri.—The market has been depressed and prices have ruled low.

Kauri Pine.

There has been a steady demand, although some difficulty has been experienced in obtaining the higher prices necessitated by the increased cost of shipments. Supplies have been sufficient but not excessive.

The abstract of stock, consumption, &c., for the month of December, published by Messrs. oy, Morgan & Co., is as follows : —

S.C. Dks. and M. Dks.	Deals (Fir).	Battens (Fir).	Pine.	Spruce.	Pitch-pine Deals.
	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.
iblic dock stock - - - - - - -	1,774,228	3,583,431	1,305,176	1,137,848	60,032
onthly public dock consumption - -	220,157	421,418	70,949	116,613	7,568
erside stock - - - - - - -	737,526	1,411,750	237,679	390,654	—
erside consumption (estimated of dock) :—					
77 per cent. Sawn - - } 50 ,, Planed - - }	169,521	324,492	54,631	89,792	—
ıration of supply at same rate of consumption - - - - - - -	6·45 months.	6·70 months.	12·29 months.	7·41 months.	7·93 months.

S.C. Dks. and M. Dks.	Deals and Battens in Aggregate.	Rough Boards (All Countries).	Flooring.	Floated Timber.
	Pieces.	Pieces.	Pieces.	Loads.
iblic dock stock - - - - - - -	7,860,715	4,443,931	8,947,611	29,511
onthly public dock consumption - -	836,705	468,858	977,661	2,611
erside stock - - - - - - -	2,777,609	1,570,674	1,280,736	—
erside consumption (estimated of dock) :—				
77 per cent. Sawn - - - - } 50 ,, Planed - - - }	638,436	361,021	488,830	—
uration of supply at same rate of consumption - - - - - - -	7·21 months.	7·25 months.	6·97 months.	11·30 months

Keystones.

The Rawson Square Market Extension in radford is now approaching completion.

Bradmore House, Hammersmith, built out 1700 and reputed to be the oldest use in the district, has been sold on a ilding lease and is to be pulled down to ake way for new property.

"Public Works," founded in July, 1903, as monthly magazine, is now published arterly. The issue for January contains number of interesting articles, including e by Mr. Killingworth Hedges on lightning otection.

A Grinling Gibbons Fireplace.—Owing to e alterations following on the recent sale Wootton Wawen Hall, near Stratford-on- von, the carving in sycamore wood of game, uit, &c., by Grinling Gibbons, which lorned the old drawing-room fireplace was ld for 175 guineas last week at Messrs. night, Frank & Rutley's galleries.

Ancient Wall-Paintings have been dis- vered in Trotton Church, Sussex. The est wall is covered with paintings which ere obliterated with lime by an icono- astic incumbent about 1850. The subjects picted are the seven deadly sins. On the rth wall the legend of St. Hubert is repre- nted, and on the south wall a figure of St. eorge, the patron saint.

"Building and Architectural Events of 04."—The illustrations of "main entrance" d "recreation and dining rooms" given p. 1 of our issue for December 28th as be- nging to the new hospital at Seacroft, eds, are really part of the Frimley Sana- rium, illustrated on p. 3 of the supplement. e architect of both institutions is Mr. lwin T. Hall, F.R.I.B.A., but Messrs. Young Hall are the architects of the Crewkerne spital.

The Usher Hall, Edinburgh, came up for scussion again at last week's meeting of e Edinburgh Town Council, but the matter as further adjourned, the committee being structed to make another attempt at uning the cost. The sum of £100,000 was t by the late Mr. Usher eight years ago, and now said to have increased to £120,000. The uncil have agreed to make a contribution at will bring up the total to £145 ; but ll are not settled as to what shall be done.

"London Old and New" is the title of an article by Mr. John Burns in the "Pall Mall Magazine" for January. It is illustrated by some fine drawings by Mr. Hedley Fitton.

The Manchester Hippodrome has been erected in Oxford Street from designs by Messrs. Frank Matcham & Co., of London, architects of the London Hippodrome and the Coliseum. In addition to the Hippodrome the block includes a restaurant and a large shop with offices over. The arena is 42ft. in diameter and contains 70,000 gallons of water below the floor, which is lowered and raised by a hydraulic ram; depths of water varying from 1ft. to 6ft. 6ins. being obtainable.

National Memorial to Queen Victoria.—The processional road along the Mall having been completed, the extension of the Mall eastwards is now to be proceeded with. Already the old Admiralty Offices in Spring Gardens and some business premises fronting Trafalgar Square have been demolished, and when possession can be obtained others will also be pulled down. A model of the memorial 8ft. high is exhibited at the Royal Academy Winter Exhibition, now open at Burlington House.

Royal Academy Lectures. Mr. Alfred Gilbert, R.A., will visit London shortly for the purpose of delivering six addresses at the Royal Academy in his capacity of Professor of Sculpture. The dates of the lectures are January 30th and February 2nd, 6th, 9th, 13th and 16th. On February 20th, 23rd and 27th and March 2nd, the Professor of Architecture, Mr. George Aitchison, R.A., will deliver four lectures on Vitruvius; and on March 3rd and 6th Professor Waldstein two on "Greek Sculpture."

Action against an Architect for Alleged Negligence.—In giving judgment in the action recently brought by Mr. Hodgson against Mr. Waugh, architect and civil engineer, of Bradford, claiming damages for illegal negligence and breach of duty (see p. 306 of our issue for December 7th) the Lord Chief Justice said that the plaintiff had in no case made out his claim to damages. He dismissed the action, and on the counterclaim entered judgment for the defendant for £1,018. A stay of execution was entered on terms with a view to an appeal.

R.I.B.A.

Discussion on Rural By-Laws and on the London Building Act.

A MEETING of the Royal Institute of British Architects was held on Monday evening at 9, Conduit Street, W., the chair being occupied by Mr. John Belcher, A.R.A., president.

The following were elected Fellows of the Institute :—Messrs. C. H. Brodie (London), G. A. Humphreys (Llandudno), W. T. Lockwood (Chester), A. E. Powles (Northwich) and E. R. E. Sutton (Nottingham).

The decease was announced of Mr. A. E. Perkins, F.R.I.B A., Mr. J. T. Wimperis, F.R.I.B.A., and Mr. A. C. Wissenden, A.R.I.B.A.

A discussion took place, first, on the paper by Mr. Lacy W. Ridge on "Building By-laws, specially in Rural Districts" and, then, on the paper by Mr. James S. Gibson on "Architectural Design and the London Building Act," which papers were reported in our issue for December 21st last.

Mr. Ridge moved that in the opinion of the meeting it was desirable that the Local Government Board should obtain Parliamentary powers to enable it to reform the by-laws now in force in rural districts and small towns, and to enable it to enact such by-laws as were necessary in rural districts.

Mr. Edwin T. Hall, in seconding the motion, emphasized the necessity of reforming rural by-laws in order to enable houses to be built cheaply so as to keep the agricultural labourer on the land. He thought it would be right for local authorities to be supplied with a block plan showing the position of a proposed building on the site.

Mr. G. Bertram Bulmer next spoke. Mr. S. W. Cranfield suggested that one code of by-laws for rural and urban districts would be sufficient if various kinds of buildings were differentiated between.

Mr. J. Douglass Mathews thought the provision exempting from the operation of the London Building Act a building a certain distance from other buildings should be extended to the local by-laws.

Mr. G. A. T. Middleton thought a single code for all districts was advisable, because relaxed by-laws in rural districts might lead people away from an urban area until the conditions were reversed.

Mr. C. H. Brodie and Mr. George Hubbard next spoke, and the motion was carried unanimously.

Mr. William Woodward opened the discussion on Mr. Gibson's paper. He first reminded the meeting that Portland Place was 120ft. wide. He advocated some such provision as in the New York by-laws which enacted that a certain percentage of site area should be left open, without regulation of position, should be substituted for the present provision in the London Building Act. He thought no body should be exempt from the operation of the Act—neither railway company, H.M. Office of Works, nor even the London County Council itself. He advocated district surveyors being practising architects, because they sympathized with their aims and helped them out of their difficulties without any detriment to the public interest.

Mr. Bernard Dicksee, district surveyor, thought the Act of 1894 was totally inadequate as regards open spaces. He strongly endorsed the view that district surveyors should be practising architects. Mr. Edwin T. Hall, Mr. E. W. Hudson and Mr. H. H. Langston also spoke. Mr. Gibson, in reply, said his object in the paper had been to point out all those details which were conducive to the artistic development of architecture. The width of streets was relative to the height of buildings. A few words from Mr. Belcher concluded the meeting.

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Jan. 12	Cork—Forty-six Houses	Town Council	City Engineer's Office, Municipal Buildings, Cork.
,, 12	Kilkenny—Thirty-three Cottages	Rural District Council	Clerk to Council, Kilkenny.
,, 12	Dorchester—Post-office	Commissioners	Post-office, Dorchester.
,, 12	Bristol—Laundry	———	W. S. Skinner, Edinburgh Chambers, Baldwin Street, Bristol.
,, 12	Clifden, co. Galway—Block of Four Dwellings	Commissioners	Engineer's Office, D'Olier Street, Dublin.
,, 12	Huddersfield—Alterations to Arcade	———	J. Kirk & Sons, Architects, Huddersfield.
,, 12	Larne, Ireland—Block of Four Dwellings	Commissioners	Engineer's Office, D'Olier Street, Dublin.
,, 12	Epping—Addition to Hospital Block	Rural District Council	Horace White, Laughton, Essex.
,, 13	Halifax—Shops, &c....	———	W. C. Williams, 29 Southgate, Halifax.
,, 13	London, W.—Houses	Chiswick U.D.C.	J. Barclay, Town Hall, Chiswick.
,, 14	Lambeth—Municipal Buildings	Corporation	H. J. Smith, Town Hall, Kennington Green, S.E.
,, 16	Bradford—Two Hospitals	Guardians	F. Holland, 11 Parkinson's Chambers, Hustlergate, Bradford.
,, 16	Coventry—Valve House	Gas Committee	F. W. Stevenson, Gasworks, Coventry.
,, 16	Glasgow—Alterations to House	Corporation	Office of Public Works, City Chambers, Glasgow.
,, 16	Glyncorrwg, N. Wales—Chapel	Rev. F. T. Williams	D. L. Evans, Blaengwynfi.
,, 16	Neath, Wales—Rebuilding of Inn	Mr. E. E. Bevan	J. C. Rees, Architect, Neath.
,, 16	Monaghan—Thirteen Cottages	Rural District Council	S. Mitchell, Boardroom, Workhouse, Monaghan.
,, 17	Bradford—Enlargement of Offices	Guardians	Empsall & Clarkson, 7 Exchange, Bradford.
,, 17	Bangour, N.B.—Homes	Edinburgh District Lunacy Board	H. J. Blanc, 25 Rutland Square, Edinburgh.
,, 18	London, S.W.—Chimney Shaft	Fulham Borough Council	F. Wood, Town Hall, Fulham.
,, 18	Croydon—Cottage, &c.	Rural District Council	R. M. Chart, Union Bank Chambers, Croydon.
,, 18	Ashford Bowdler—Restoration of Church	———	Nicholson & Bartree, Architects, Hereford.
,, 19	Billericay—Conversion of Town Hall into Police Station	Joint Committee	F. Whitmore, Duke Street, Chelmsford.
,, 19	East Ham—Enlargement of Schools	Education Committee	R. L. Curtis, 11 and 12 Finsbury Square, E.C.
,, 20	Kidderminster—Engine-house, &c.	Corporation	Wilcox & Raikes, Union Chambers, 63 Temple Row, Birmingham.
,, 20	Rotherham—Post-office	Commissioners	H.M. Office of Works, Storey's Gate, S.W.
,, 21	Plymouth—Removal of Partition	Education Authority	E. C. Cook, Secretary, 18 Princess Square, Plymouth.
,, 21	Leicester—Police Court, &c.	County Council	S. P. Pick, 6 Millstone Lane, Leicester.
,, 25	Deri, Wales—Thirty-two Houses	No. 2 Building Club	P. V. Jones, Architect, Hengoed.
,, 25	Erdington, Birmingham—Council House, &c.	Urban District Council	G. Kerrick, 73 Colemore Row, Birmingham.
,, 26	London, E.—School	London County Council	Architect's (Education) Department, Room 148 Education Office Victoria Embankment, E.C.
,, 28	Ruthin—School	Education Authority	W. Slater, 9 High Street, Wrexham.
,, 30	Blything—Fire-escape Staircase	Guardians	H. A. Mullens, Union Offices, Bulcamp, Halesworth, Suffolk.
Feb. 8	Wembley—Four Cottages	Urban District Council	C. R. W. Chapman, Public Offices, Wembley.
,, 11	Shepton Mallett—School	Education Committee	County Education Secretary, Weston-super-Mare.
,, 28	Preston—School	Corporation	Director of Education, Education Offices, Preston.
	ENGINEERING:		
Jan. 12	Belfast—Boilers	Public Health Committee	Town Clerk, Town Hall, Belfast.
,, 12	Ormskirk, Lancs—Electric Lighting Apparatus	Guardians	G. R. Peers, 16 John Dalton Street, Manchester.
,, 12	Drogheda—Well, &c.	Louth Rural District Council	Council Offices, Drogheda.
,, 12	Wing, Bucks—Sinking Borehole	Rural District Council	Sands & Walker, Milton Chambers, Milton Street, Nottingham.
,, 12	London, S.E.—Bridgework, &c.	Burma Railways Co.	Company's Offices, 76 Gresham House, Old Broad Street, E.C.
,, 12	Bettws-y-coed, Wales—Waterworks Extension	Urban District Council	Council Offices, Church Hill, Bettws-y-coed.
,, 14	Poole—Quay Wall	Harbour Commissioners	H. F. J. Barnes, Towngate Street, Poole.
,, 14	Bootle, Lancs—Water-softening Plant	Corporation	Borough Electrical Engineer, Bootle.
,, 16	Gravesend—Electric Lighting	Education Committee	C. F. McInnes, Electricity Works, Gravesend.
,, 16	London, S.E.—Alternator, &c.	Electric Supply Corporation	Kincaid, Waller, Manville & Dawson, 29 Great George Street, S.W.
,, 16	Devonport—Lift	Guardians	H. G. Luff, 64A Chapel Street, Devonport.
,, 16	Oulton—Hot- and Cold-water Supply at Hospital	Joint Committee	Olley & Haward, 5 Queen Street, Great Yarmouth.
,, 16	Port Elizabeth, S.A.—Electricity Supply Works	Corporation	Davis & Soper, Agents to Municipal Corporation, Port Elizabeth, S.A
,, 18	Ripon—Re-tubing Condensers	Corporation	Gas Manager, Gas Works, Ripon.
,, 18	Harrogate—Penstocks, &c.	Corporation	E. W. Dixon, 1A Cambridge Crescent, Harrogate.
,, 19	Kemeys, Mon.—Bridge	County Council	County Surveyor, Newport, Mon.
,, 21	Firsby, Lincs—Removal of River Deposit	Drainage Commissioners	J. H. Johnson, Witham Office, Boston.
,, 23	Epsom—Hot-water Plant, &c.	Asylums Committee	Clerk to Committee, 6 Waterloo Place, S.W.
,, 23	London, S.E.—Footbridge, &c.	Camberwell Borough Council	Town Hall, Camberwell.
,, 24	London, N.—Fire Alarms	Metropolitan Asylums Board	Offices of Board, Embankment, E.C.
,, 26	Swindon—Boiler	Corporation	J. G. Griffin, Electricity Works, Swindon.
,, 28	Giurgevo, Roumania—Electric Light	———	Municipal Offices, Giurgevo.
,, 28	Drax, near Selby—Electric Lighting	———	W. St. D. Brennan, Read's Grammar School, Drax.
,, 30	Swansea—Brick and Flag Plant	Corporation	Borough Surveyor, 13 Somerset Place, Swansea.
,, 30	Edinburgh—Gas Exhausters, Engines, &c.	Gas Commissioners	W. R. Herring, New Street Gasworks, Edinburgh.
,, 30	Chertsey—Construction of Two Bridges	Rural District Council	R. St. George More, 17 Victoria Street, S.W.
March 31	Shanghai—Electric Tramways	Municipal Council	J. Poor & Co., 63 Leadenhall Street, E.C.
April 1	Lulea, Sweden—Dredging	———	Harbour Office, Lulea, Sweden.
May 1	Suakin (Red Sea)—Lighthouse	Ports and Lights Administration	Deputy-Controller-General, Ports and Lights Administration, Alexandri Egypt.
	IRON AND STEEL:		
Jan. 12	Kilkenny—Iron Gates	Rural District Council	K. Comerford, Clerk, Kilkenny.
,, 16	Kington, Hereford—Tank	Guardians	A. Temple, Union Offices, Kington.
,, 16	Amsterdam—Mains	Municipal Council	Wed. P. van Waesberge & Zoon, Houthin 73, Rotterdam.
,, 16	Rochdale—Points and Crossings	Corporation	S. S. Platt, Town Hall, Rochdale.
,, 25	Leicester—Steel Roofs	Corporation	E. G. Mawbey, Town Hall, Leicester.
,, 26	Johannesburg, S.A.—Rails	Municipal Tramways	Mawdey & Dawbarn, 82 Victoria Street, S.W.
	PAINTING AND PLUMBING:		
Feb. 6	Manchester—Painting Various Places	Lancs and Yorks Railway Co.	Engineer's Office, Hunt's Bank, Manchester.
	ROADS AND CARTAGE:		
Jan. 12	London, N.E.—Making-up Streets	Hackney Borough Council	N. Scorgie, Borough Engineer, Town Hall, Hackney.
,, 14	Banbury—Stone	Town Council	N. H. Dawson, Town Hall, Banbury
,, 14	Bridgwater—Stone	Rural District Council	C. M. Read, Clerk, Council Offices, Bridgwater.
,, 16	Dunoon, Ireland—Road Widening	Town Council	J. Andrew, Borough Engineer, Dunoon.
,, 16	Eastbourne—Private Improvement Works	Highways Drainage Committee	Borough Surveyor, Town Hall, Eastbourne.
,, 16	London, N.W.—Kerbing, &c.	Hendon U.D.C.	S. S. Grimley, Council Offices, Hendon.
,, 16	Warrington—Forming and Paving Street	Paving and Sewerage Committee	Borough Surveyor, Town Hall, Warrington.
,, 16	Londonderry—Street Paving	Town Council	W. J. Robinson, City Surveyor, Londonderry.
,, 18	London, S.W.—Making-up Road, &c.	Fulham Borough Council	F. Wood, Town Hall, Fulham.
,, 19	Rugby—Roads, &c.	Benefit Building Society	J. T. Franklin, Regent Street, Rugby.
,, 20	Willesden—Road-making, &c.	District Council	O. C. Robson, Public Offices, Dyne Road, Kilburn.
,, 20	Birmingham—Kerbs, Setts, &c.	Public Works Committee	City Surveyor's Office, Council House, Birmingham.
,, 21	Hailsham—Road Materials, &c.	Rural District Council	E. Catt, 17 London Road, Hailsham.
,, 23	Camberwell—Footbridge, &c.	Council	W. Tagg, Town Hall, Camberwell.
,, 26	London—Road-work and Plate-laying	London County Council	Council's Chief Engineer, County Hall, Spring Gardens, S.W.
,, 31	Sanghall Massie, Cheshire—Road	Wirral R.D.C.	T. Davies, 33 Kingsland Road, Birkenhead.
	SANITARY:		
Jan. 12	Worksop—Scavenging	Urban District Council	G. H. Featherston, Town Hall, Worksop.
,, 12	Merthyr, Wales—SewerWorks	Farms Management Committee	T. F. Harvey, Town Hall, Merthyr.
,, 14	Evesham—Sewerage Works	Rural District Council	Barrington & Son, Engineers, Wolverhampton.
,, 14	Bexley Heath, Kent—Sewers	Urban District Council	Council Offices, Bexley Heath.
,, 16	Guildford—Sewer	Town Council	G. G. Mason, Borough Surveyor, Tuns-gate, Guildford.
,, 16	West Bromwich—Removal of Night-soil, &c.	Corporation	Inspector of Nuisances, Market Hall, West Bromwich.
,, 21	Ludlow—Sewerage Works	Town Council	J. H. Williams, Town Clerk, Ludlow.
,, 21	Yeovil—Sewerage Works	Rural District Council	A. J. Martin, 7 Victoria Street, S.W.
,, 23	Horsham—Sewage-disposal Works	Rural District Council	A. C. Coole, Solicitor, Horsham.
,, 23	Manchester—Reconstruction of Sewer	Corporation	City Surveyor's Office, Town Hall, Manchester.
,, 24	Tendring, Essex—Sewage-disposal Works	Guardians	A. J. Martin, 7 Victoria Street, S.W.
,, 26	Stroud—Manholes, &c.	Rural District Council	Fisher & Milnes, 6 Rowcroft, Stroud.
,, 28	Sowerby Bridge, Yorks—Sewage-disposal Works	Urban District Council	C. L. Whitehead, Holling's Mill Lane, Sowerby Bridge.
,, 30	Windsor—Sewer	Streets Committee	Borough Surveyor's Office, Windsor.

Electrical Notes.

The Electrical Contractors again.

As we foretold some time ago, the notice
hich the Electrical Manufacturers' Associa-
on gave the Electrical Contractors' Associa-
on has been determined, as the latter body
said to have wished to renew under terms
hich the former could not consider. Both
des allege grievances against the other—the
ontractors that the manufacturers have been
reaking the terms of the agreement by
iving preferential discounts (not to say
rdinary trade discounts) to persons outside
ie legitimate trade; whilst the manufac-
urers allege that the contractors have been
uying from other houses. It is understood
iat negotiations will be opened with a view
a fresh agreement, although we think that
the interests of the community generally
ich trusts are not to be encouraged. It
ractically means that the contractor one
mploys to wire a house is debarred from
uying in the cheapest market, and for that
isadvantage he has been getting a preferen-
ial discount of 2½ per cent. As the customer
oes not benefit by this discount, but has to
ay higher for all his fittings, &c., in order
hat he and his class shall be prevented from
btaining any discounts, we fail entirely to
ee who benefits in the long run, as the con-
ractors' turnover would, owing to this cause,
not be inclined to increase.

An Interesting Private Plant.

Messrs. Drake & Gorham, Ltd., are putting
lown an installation at the famous resi-
lence of Lord St. Levan, namely, St.
Michael's Mount, about which there are one
or two novel features. Owing to the fact
that the walls of the castle are often soaked
by sea spray, it has been deemed best to put
n a system of watertight concentric conductors in order that the risk from fire shall be reduced to practically nil. The generating plant will consist of two dynamos driven by internal combustion engines, and also of a large battery of accumulators. In addition to electric lighting, the plant will provide power to a small cable tramway which is used for bringing up goods from the sea-level through a tunnel into the mount.

The new Lyceum.

The electric-light installation at the above new music-hall has been carried out by the National Electric Construction Co. under the superintendence of Mr. Thomas J. Digby, consulting engineer. The supply is taken from the Metropolitan and the Charing Cross and Strand companies. The latter on the 3-wire system, but 200 volts pressure is used on both services, which are divided up amongst the various circuits. Change-over switches can throw the supply of either company on to the whole or part of the circuits. Except in the dressing-rooms, where casing is used, the whole of the installation is wired in solid-drawn screwed barrel, into which Henley cables of 2,500 megohm grade are drawn. The fittings were supplied by the General Electric Co. to the approval of the architect, Mr. Bertie Crewe. Altogether there are about 2,000 lights, of which the dome of the auditorium has 180 split up amongst 20 nine-light electroliers. In addition to these are many clusters, brackets, candelabras and standards, the prevailing design being Louis XV. Current is also supplied for "Excello" flame arc lamps at the exits, and for ventilating motors, whilst 100 ampères are required for the cinematograph lantern. The latter is in a room of special fireproof construction. The whole of the wiring was completed in the record time of two months.

B.O.T. Three-phase Regulations.

The Board of Trade has just issued regulations dealing with extra high-pressure for three-phase current supply systems. Some of the important points are as follows:—The low-pressure supply will be given from sub-stations by continuous or alternating current on a three-wire system; all alternating current to be at a frequency not differing from 25or 50 cycles per second by more than 2½ per cent. The power supplied to any sub-station below ground must not exceed 75 kilowatts, except by consent of the Board. The power supplied to a transformer placed singly in a street box must not exceed 30 kilowatts without consent of the Board. The extra high-pressure shall not exceed the specified volts by more than 10 per cent., whilst not more than 1,000 kilowatts shall at any time be transmitted by any extra high-pressure trunk main. The neutral point of the star windings of each three-phase circuit may be connected with earth, or insulated. If the latter, an electrostatic galvanometer must be connected between it and earth.

A.M.I.E.E.

A new Lectureship in the History of Art has been instituted at University College, London, the lecturer being Mr. D. S. MacColl, M.A. (London), B.A. (Oxon.). During the past term Mr. MacColl delivered lectures on "The History of Art from Hogarth to Constable." He will continue his course in the coming term on alternate Fridays at 4.30 p.m., beginning on January 13th, the subject of this course being "English Art from Constable to the Present Time." The lectures are open to the public as well as to students on payment of the fee of one guinea. Applications for tickets should be addressed to the secretary of University College.

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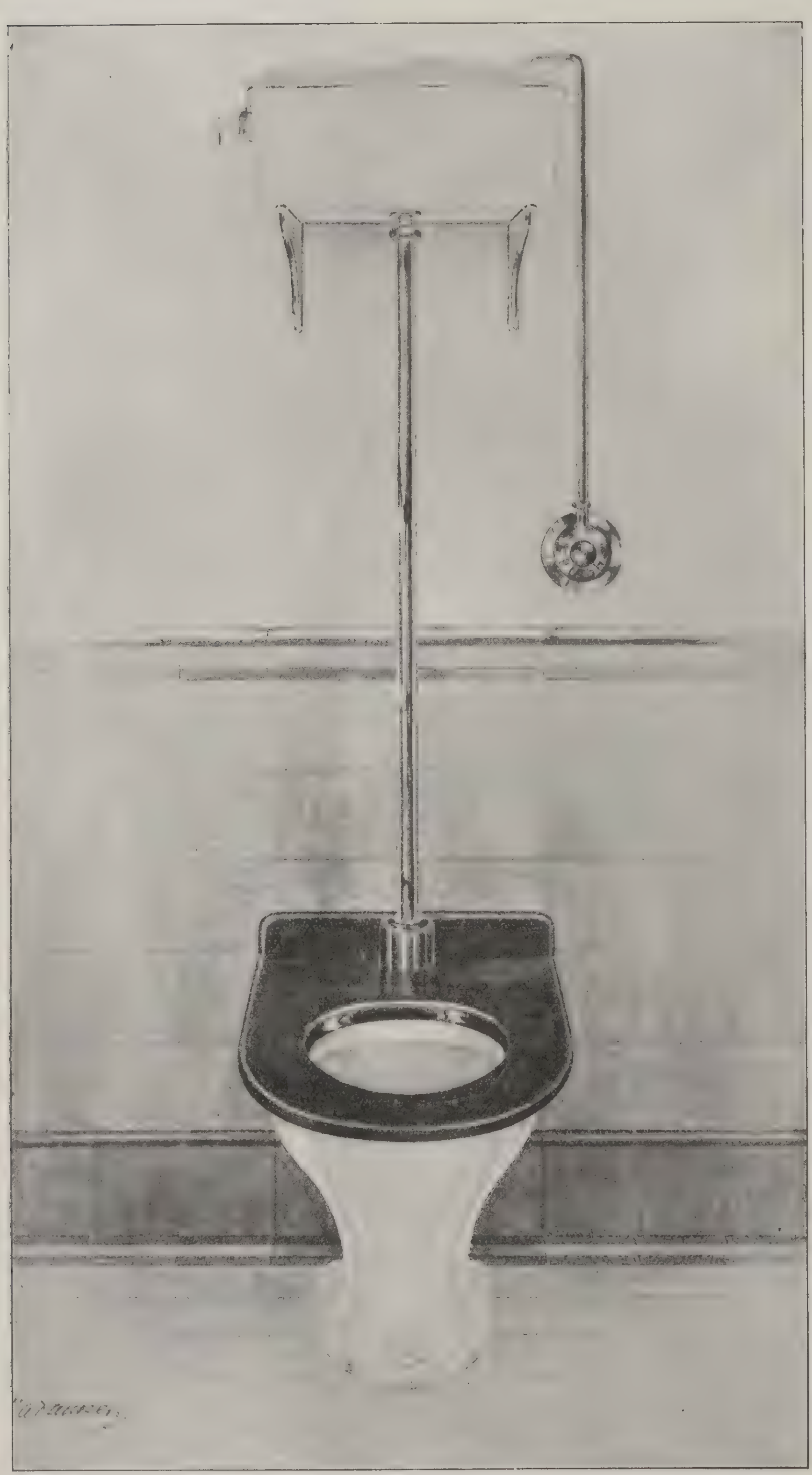

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When writing to Advertisers please mention the Builders' Journal.

List of Competitions Open.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Jan.	16	Dover—Light Railway	——	£5 5s.	Borough Engineer, Maison Dieu House, Dover.
,,	17	Belfast—Libraries...	——	——	Chief Librarian, Public Library, Royal Avenue, Belfast.
,,	30	Swansea—Brick and Flag Plant	——	£1 1s.	Borough Surveyor, 13 Somerset Place, Swansea.
,,	31	Llanelly—Remodelling School Buildings	£20 & £10	——	J. W. Watkins, Education Office, Llanelly.
Feb.	1	Oxford—School	——	£1 1s.	Education Committee, 8 New Road, Oxford.
,,	28	Aylesbury—School	£50 & £25	£1 1s.	C G. Watkins, Education Offices, Aylesbury.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, Builders' Journal, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Bristol.—For pulling down old buildings and forming roads and sewers at Horfield Court Farm Estate. Mr. W. P. Saunders, surveyor, Rupert Chambers, Quay Street, Bristol:—

Free & Co.	£1,838	15	11
J. Dare & Co.	1 799	0	0
J. Hatherley	1,733	0	0
G. Tyler	1,600	0	0
W. & J. Bennett	1,395	0	0
Mereweather & Sons	1,317	0	0
Wilkins & Gosling,* Ashley Road	1,300	0	0
W. Brindon	1,055	0	0
M. Parker†	950	0	0

* Accepted. † Withdrawn.

[All of Bristol.]

Church Stretton (Salop).—For constructing and laying about 7,600 yds. of stoneware and cast-iron pipe sewers from 15ins. to 9ins. in diameter, sewage-disposal works, &c., for the U.D.C.:—

R. H. B. Neale, Ltd., Plymouth	£12,028	0	0
J. Moore, Rochdale	10,420	19	0
Fisher & Le Fanu, Belfast	10,384	4	9
W. Griffiths & Co., London, E.C.	10,242	8	9
T. Taylor, Pontypridd	9,983	2	1
E. Ireland, Trowbridge	9,669	12	11
Greaves & Wheater, Calverley	9,508	8	3
J. Byrom, Bury	9,017	2	5
E. Powell, Whitchurch, near Cardiff	8,986	2	10
G. Bell, London	8,979	0	0
J. & T. Binns, Croydon	8,774	0	9
Johnson & Langley, Leicester	8,766	10	0
A. Braithwaite & Co., Leeds	8,300	17	7
G. Rutter, Barry	8,135	0	0
McCarthy & Co., Coventry	8,084	0	0
J. Riley, Cheltenham	8,050	0	3
B. Frith & Co., York	7,765	15	10
W. Morley & Sons,* 114, Devonshire Street, Keighley	7,578	5	6
W. Jowett, Prescot	7,161	7	0

* Accepted.

Croydon.—For the erection of girls' meeting hall in Bynes Road, South Croydon. Mr. Frank Windsor, architect, 1, High Street, Croydon:—

T. Wawman	£223	6	0
J. Pursley	195	0	0
R. Bex	173	0	0
W. Gowman*	146	0	0

* Accepted. [All of Croydon].

Croydon.—Accepted for the erection of eight houses and office at Anchor Place. Mr. Frank Windsor, architect, 1, High Street, Croydon:—

E. I. Saunders, Croydon	£2,925

Croydon.—For the erection of a detached house in Lismore Road. Mr. Frank Windsor, architect, 1, High Street, Croydon:—

Sedgewick Brothers	£839
J. Everitt	£743
Pearson & Co.	735
W. Gowman*	733

* Accepted. [All of Croydon.]

Croydon.—For proposed alterations at "Knighton," Pampisford Road. Mr. Frank Windsor, architect, 1, High Street, Croydon:—

D. W. Barker	£198
W. J. Bailey	185

Dublin.—For the erection of central fire-brigade station, Great Brunswick Street and Tara Street, for the Corporation. Mr. C. J. M'Carthy, city architect, Municipal Buildings, Dublin:—

P. J. Byrne & Son	£20,345	0	0
J. P. Pile	19,700	0	0
J. & F. Pemberton	19,430	0	0
H. J. Monks	19,000	0	0
W. Conolly	18,643	0	0
Collen Brothers, Ltd.	18,500	0	0
J. Pemberton & Son	18,158	0	0
H. & J. Martin	17,599	11	0
J. & P. Good	17,499	0	0
J. & W. Stewart	16,684	0	0
J. Donovan & Son*	16,450	0	0

* Recommended for acceptance.

Dublin.—Accepted for the basement and shops of the second portion of the city hall:—

G. H. Panton	£15,268

Hull.—For making alterations to premises No. 33, Paragon Street, for Mr. J. W. Locking. Messrs. Thompson & Kirton, architects, Exchange Buildings, Lowgate, Hull:—

Dalton	£155	0	0
Bray	120	0	0
Jechells	117	10	0
Frankish	106	0	0
Singleton	100	0	6
Taylor & Son	97	15	6
Winduss,* 307, Hessle Road	93	0	0

* Accepted. [All of Hull.]

Purley.—For the erection of a stable in Brighton Road. Mr. Frank Windsor, architect, 1, High Street, Croydon:—

W. Walker, Purley	£490
W. Pearson & Co., Croydon	420

Purley.—For the erection of a billiard-room in Brighton Road. Mr. Frank Windsor, architect, 1, High Street, Croydon:—

W. Walker, Purley	£580
W. Pearson, Croydon	435

A new Baptist Church and School at Newcastle-under-Lyme is to be erected from designs by Mr. E. Stanley Mitton, of Birmingham. The church will be raised 5ft. above ground level, the school being placed under, with accommodation for 300, large classroom and vestries being provided, with exits at each end. The outside will be faced with red terra-cotta. Heating will be by low-pressure hot water.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

During the week ending January 6th twenty-two failures in the building and timber trades in England and Wales were gazetted.

H. Parsons, builder, Ickleton. Adj. Dec. 23rd.

T. Moon, slater and tiler, Clay Cross. R.O. Dec. 30th.

G. Baker & Son, builders, Wimborne. Adj. Dec. 23rd.

D. Roberts, builder, Manchester. R.O. Dec. 22nd.

J. Berry, builder, Lewes. R.O. Dec. 23rd.

J. E. Bowen, builder, Garnant. R.O. Dec. 31st.

Lewis & Son, builders and contractors, Maesteg R.O. Dec. 29th.

J. H. Booth, painter and decorator, Ilkeston. P.E., Derby C.C., Jan. 17th, at 11.

Parker & Co., builders, decorators, &c., Manor Park R.O. Dec. 31st.

O. Capell, builder and contractor, Dover. R.O Dec. 31st.

W. Good, builder, Cleethorpes. P.E., Grimsby Town Hall, Feb. 2nd, at 11.

F. Willmot, painter and plumber, Birmingham. R.O. Dec. 29th.

H. Leggott & Co, architectural ironmongers, Bradford. Adj. Dec. 23rd.

W. Newlove, builder, Hull. First meeting, O.R.'s, Hull, Jan. 11th, at 11. P.E., Hull C.C., Jan. 23rd, at 2.

A. Williams, builder and contractor, Rhyl. First meeting, Crypt Chambers, Chester, Jan. 11th, at 12. P.E. Magistrates' Room, Bangor, Jan. 12th, at 12.30.

Child Brothers, builders and contractors, Darlington. First meeting, O.R.'s, Middlesbrough, Jan. 18th, at 3. P.E., Stockton-on-Tees C.C., same day, at 10.45.

T. Norrell, builder, Chadwell Heath. R.O. Dec. 28th. First meeting, London Bankruptcy Court, Jan. 16th, at 12. P.E., same, Feb. 10th, at 11.30.

F. E. Eales, architect and surveyor, East Twickenham. R.O. Dec. 30th. First meeting, London Bankruptcy Court, Jan. 12th, at 12. P.E., same, Feb. 9th, at 11.30.

T. W. Hudson, builder, Mill Hill. First meeting, 14, Bedford Row, London, W.C., Jan. 13th, at 3. P.E., Barnet Town Hall, Jan. 26th, at 11.

A. J. Geary, builder, Burton-on-Trent. R.O. Dec. 23rd. First meeting, Midland Hotel, Burton, Jan. 11th, at 11.30. P.E., Burton C.C., Jan. 18th, at 12.

W. J. Rice, builder, Lowestoft. First meeting, O.R.'s, Norwich, Jan. 14th, at 12.30. P.E., Yarmouth Town Hall, Jan. 17th, at 11.

T. J. Harrop, joiner and contractor, Rotherham. First meeting, O.R.'s, Sheffield, Jan. 12th, at 1. P.E., same, at 2.

W. Mottram & Son, builders' merchants, Sheffield. First meeting O.R's., Sheffield. Jan. 12th, at 12. P.E., same, at 2.

W. & E. Sumner, electrical and mechanical engineers, Liverpool and West Kirby. First meeting, O.R.'s, Liverpool, Jan. 13th, at 12. P.E. Liverpool C.C., Jan. 19th, at 11.

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AN ARCHITECT is willing to render assistance in his own office in the preparation of perspectives, designs, working drawings, quantities, &c.—Chas. Carter, M.S.A., Sherwood Lodge, Nottingham. 386

A JUNIOR ASSISTANT requires Situation, good at tracing, inking in, and colouring, 5 years' City experience (age 24), London, West preferred.—Apply G. A. Middleweek, Melbourne Lodge, Melbourne Square, Brixton, S.W. 846

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ARCHITECT and SURVEYOR'S ASSISTANT (24) Disengaged, nine years' good experience in Lancashire and the North; thoroughly reliable and competent; designs, quantities, details, perspectives; excellent references.—C. W. T., 155, Manchester Road, Burnley, Lancs. 837

ARCHITECT and SURVEYOR'S experienced Assistant, good surveyor, neat draughtsman, good all-round experience; moderate salary; excellent references.—Dudgeon, Sunnycroft, Fosse Road North, Leicester. 870

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ARCHITECT'S ASSISTANT (23), 7 years' experience, desires ENGAGEMENT; design, detail, surveying, levelling; usual routine, good references, salary 25s.—H. T. R., 26, Calthorpe Street, London, W.C. 868

ARCHITECT desires engagement; 10 years' experience, exceptional qualifications, artistic and capable designer and draughtsman, details, and usual routine. Moderate salary.—Box 842, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

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ARCHITECT and SURVEYOR'S ASSISTANT required in a country office. Must have thorough knowledge of construction and be a competent draughtsman, surveyor, and leveller. Commencing salary, £2 10s. per week. Also a good JUNIOR. Salary from 1½ guineas, according to experience. Write full particulars of experience, age, and when disengaged, to the County Surveyor, Hatfield.

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Too late for Classification.

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861.—Builder's Clerk wants two days per week, abstracting, p.c., and jobbing acs.

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865.—Architect's Junior Assistant, age 23, wants London appt., 4½ years' exp. Good refs., mod. s.

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867.—Monumental Letter Cutter, age 39, carver and mason, long exp., drawing and modelling.

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869.—Builder's Clerk and Draughtsman (23), wkg. and detail drawings, tracings, quantities, estimating, contract and jobbing.

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871.—Watchman or Caretaker, 18 yrs. refs., married, would pay security for permanency.

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873.—Builder's Estimator and Measuring-up Clerk (37), good business abilities and sound knowledge of trade.

See p. xx for the Employment Register.

SEE PAGE XX FOR EMPLOYMENT REGISTER.

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Detailed Programme and Conditions may be had on application to the Subscriber, C. J. MACLEAN, 115, St. Vincent Street, Glasgow, Secretary and Treasurer.

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Plans and Specifications can be seen, and full particulars obtained at the Offices of Messrs. THOMPSON & KIRTON, Architects and Surveyors, Exchange Buildings, Lowgate, Hull, on and after the 31st day of December, 1904.

Sealed Tenders, endorsed, "High Brighton Street," to be delivered to me at my Office, by Noon, on the 7th DAY OF JANUARY, 1905.

The lowest or any Tender not necessarily accepted.

(Signed) FREDK. J. GARDAM,
Clerk to the Council.
Parliament Street, Hull.

RUGBY URBAN DISTRICT COUNCIL.
TO STONE MERCHANTS.

The Urban District Council of Rugby invites TENDERS for supplying Broken Stone for the repairs of the highways within their district for the year ending the 31st day of DECEMBER, 1905.

Specification and Form of Tender may be obtained on application at my office.

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Samples of the stone as it is proposed to be supplied to be sent carriage paid to my office on or before the 20th inst.

The Council do not bind themselves to accept the lowest or any Tender.

By Order,
D. D. MACDONALD, Assoc.M.Inst.C.E.,
Surveyor to the Council.
Rugby, Jan. 6th, 1905.

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COUNTY DOWN.
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520 do. 3-inch do. do.

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Clerk to the Council.
Town Hall, Bangor, County Down,
29th December, 1904.

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Town Hall, Bangor, County Down,
29th December, 1904.

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1. Every regular reader of the BUILDERS' JOURNAL is entitled to the benefit of this Insurance.
2. A Pamphlet giving full details of this and other Insurance schemes inaugurated by the BUILDERS' JOURNAL for the benefit of its readers, and guaranteed by "The Ocean Accident Corporation, Limited," will be sent on application.

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We have employed the term "Regular Reader" throughout these announcements as the description "subscriber" is often understood to mean one who subscribes direct to the publishing office.

We mean by a Regular Reader anyone who has placed an order with us or any newsagent or bookstall for the BUILDERS' JOURNAL for one year.

Those readers who order the BUILDERS' JOURNAL through their local newsagent or bookstall should send us the newsagent's receipt. Their names will then be placed on our subscribers' list, and they will be entitled to all the advantages set out above.

5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS.
OFFICE: 6, GREAT NEW STREET, FETTER LANE, E.C.

Current Market Prices.

FORAGE.		£	s.	d.	£	s.	d.
Beans	per qr.	1	14	0	2	0	0
Clover, best	per load	3	15	0	4	2	6
Hay, good	do.	3	10	0	3	15	0
Sainfoin mixture ...	do.	3	10	0	3	17	6
Straw	do.	1	12	0	2	0	0
OILS AND PAINTS.							
Castor Oil, French ...	per cwt.	1	0	5		—	
Colza Oil, English ...	do.	1	1	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0		—	
Linseed Oil, barrels ...	per cwt.	0	14	10½		—	
Petroleum, American ...	per gal.	0	0	5½		—	
Do. Russian ...	do.	0	0	$4\frac{7}{8}$		—	
Pitch	per barrel	0	8	0		—	
Shellac, orange	per cwt.	7	5	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	5	6		—	
Tar, Stockholm	per barrel	1	3	6		—	
Turpentine	per cwt.	1	17	7½		—	
METALS.							
Copper, sheet, strong ...	per ton	80	0	0		—	
Iron, Staffs., bar	do.	5	15	0	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	10	0	10	15	0
Lead, pig, Soft Foreign...	do.	13	2	6	13	3	9
Do. do. English common brands	do.	13	7	6	13	10	0
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14	0	0		—	
Do. pipe	do.	15	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	5	0		—	
Do. floor brads... ...	do.	9	0	0		—	
Steel, Staffs., Girders and Angles	do.	5	10	0	6	0	0
Do. do. Mild bars ...	do.	6	0	0	6	5	0
Tin, Foreign	do.	133	2	6	133	12	6
Do. English ingots ...	do.	134	0	0	135	0	0
Zinc, sheets, Silesian ...	do.	28	0	0		—	
Do. do. Vielle Montaigne	do.	29	0	0		—	
Do. Spelter	do.	25	5	0	25	10	0
TIMBER.							
Soft Woods.							
Whitewood, American, logs.	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	1	6
Fir, Dantzic and Memel	per load	2	7	6	4	15	0
Pine, Quebec, Yellow ...	do.	4	0	0	7	0	0
Do. Pitch, American...	do.	2	10	0	6	0	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, Uleaborg, Yellow, 4×12	per std.	6	15	0		—	
Do. do. do. 4×10	do.	7	5	0		—	
Do. do. do. 4×9	do.	8	10	0		—	
Do. Archangel, Yellow, 2nd, 4×11	do.	17	5	0		—	
Do. do. do. do. 3×11	do.	15	15	0		—	
Do. do. do. do. 3×9	do.	14	15	0		—	
Do. do. do. 3rd, 4×11	do.	13	0	0		—	
Do. St. Petersburg, White, 1st, 3×11	do.	11	5	0		—	
Do. do. do. 3rd, 3×11	do.	8	10	0		—	
Do. do. Yellow, 2nd, 3×11	do.	9	10	0		—	
Do. do. do. do. 3×9	do.	8	10	0		—	
Do. do. do. 3rd, 3×9	do.	8	5	0		—	
Do. Kallskar Yellow, 4th, 2½×7	do.	8	15	0		—	
Do. do. do. 5th, 3×9	do.	8	10	0		—	
Do. Stugsund, do. 5th, 2½×7	do.	8	5	0		—	
Do. Kristinestad, Yell., Unsorted, 2½×7	do.	8	10	0		—	
Do. West Bay (N.S.), Spruce, 1st, 2nd & 3rd, 3×5	do.	6	0	0		—	
Do. Amburst (N.S.), Spruce, Unsorted, 3×9...	do.	8	0	0		—	
Do. do. do. do. 3×8	do.	7	10	0		—	
Do. do. do. do. 3×7	do.	7	10	0		—	
Do. do. do. do. 3×6	do.	7	0	0		—	
Battens, all kinds	do.	5	15	0	9	10	0
Flooring Boards 1in. prepared, 1st... ...	per square	0	8	9	0	9	9
Do. 2nd	do.	0	8	3	0	9	0
Do. 3rd, &c.	do.	0	7	0	0	8	6
Hard Woods.							
Ash, Quebec	per load	4	10	0	7	15	0
Birch, New Brunswick...	do.	2	15	0	6	0	0
Box, Turkey	per ton	8	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	3½		—	
Do. Honduras ...	do.	0	0	$3\frac{1}{32}$		—	
Do. Tobasco	do.	0	0	$5\frac{7}{32}$		—	
Elm, Quebec	per load	4	5	0	8	15	0
Mahogany, Average Price for Cargo, Honduras...	per ft. sup.	0	0	$5\frac{1}{17}$		—	
Do. African ...	do.	0	0	$3\frac{2}{32}$		—	
Do. St. Domingo	do.	0	0	4		—	
Do. Cuba ...	do.	0	0	$1\frac{15}{16}$		—	
Do. Lagos ...	do.	0	0	$4\frac{1}{8}$		—	
Do. Benin ...	do.	0	0	$2\frac{21}{32}$		—	
Do. Tobasco ...	do.	0	0	$6\frac{5}{32}$		—	
Oak, Wainscot	per log.	2	5	0	5	15	0
Do. American quartered, planks and boards	per ft. cu.	0	2	6	0	5	0
Do Dantzic & Stettin	per load	3	0	0	6	10	0
Do. Quebec	do.	5	0	0	8	0	0
Teak, Rangoon, planks...	do.	8	0	0	15	10	0
Do. Indian logs ...	do.	10	0	0	18	10	0
Do. Indian planks ...	do.	13	0	0	20	0	0
Do. Moulmein logs ...	do.	6	10	0	8	0	0
Kaurie pine logs	per ft. cu.	0	1	6	0	2	0
Do. do. planks ...	do.	0	3	0	0	3	6

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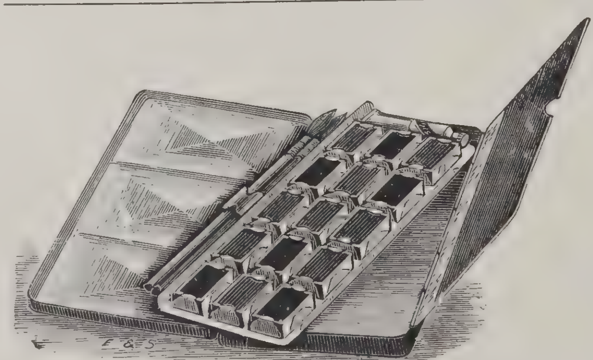

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THE
BUILDERS' JOURNAL
AND ARCHITECTURAL RECORD.

January 18, 1905 Vol. 21, No. 519. 6, Great New Street, Fetter Lane, E.C.

Summary.

A standard specification for Portland cement has just been issued by the Engineerng Standards Committee. It will be a great convenience to consumers and manufacturers. This page.)

The date of the opening of the Building Trades' Exhibition has been altered from the 29th to the 27th of April. Lord Windsor will open the exhibition. (Page 34.)

The Architectural Vigilance Society protests against the proposed new front to Victoria Station as being a huge mass of architectural commonplace unworthy of its important position. (Page 34.)

The David Lewis workmen's hostel and club, which has been erected in Liverpool at a cost of £100,000, is very much on the lines of the Rowton houses. There are 400 cubicles. The charge for each is 6d. per night, including the use of the club-rooms. (Page 30.)

Architects' registration was the main topic at the annual dinner of the Leeds and Yorkshire Architectural Society. Mr. Alfred Darbyshire said the question was the most vital one that had arisen in the profession in his lifetime. One of the wisest things the Institute had ever done was to open its arms to the brethren in the provinces. (Page 35.)

In a paper which he read last week before the Sheffield Society of Architects and Surveyors, Mr. Horace Wilson said that an easement imposed on the owner of the land subject to it only a duty to suffer something or refrain from doing something for the benefit of his neighbour; for example, the grantor of a right of way was only bound to allow the use of the way, not to keep it in repair; and similarly in the case of ancient lights he was only obliged to refrain from obstructing the light. The "45 degrees rule" had fallen upon evil times, having been declared in the Court of Appeal and the House of Lords to be worth very little as a guiding principle. (Page 33.)

The City Corporation has decided to oppose the London Building Acts Amendment Bill. (Page 34.)

The Alexander Thomson travelling studentship is to be again competed for this year, drawings having to be submitted by December 28th. (Page 34.)

The first Henry Saxon Snell prize (value £50 and a medal) is offered for an essay on the improvement of domestic sanitary appliances. (Page 34.)

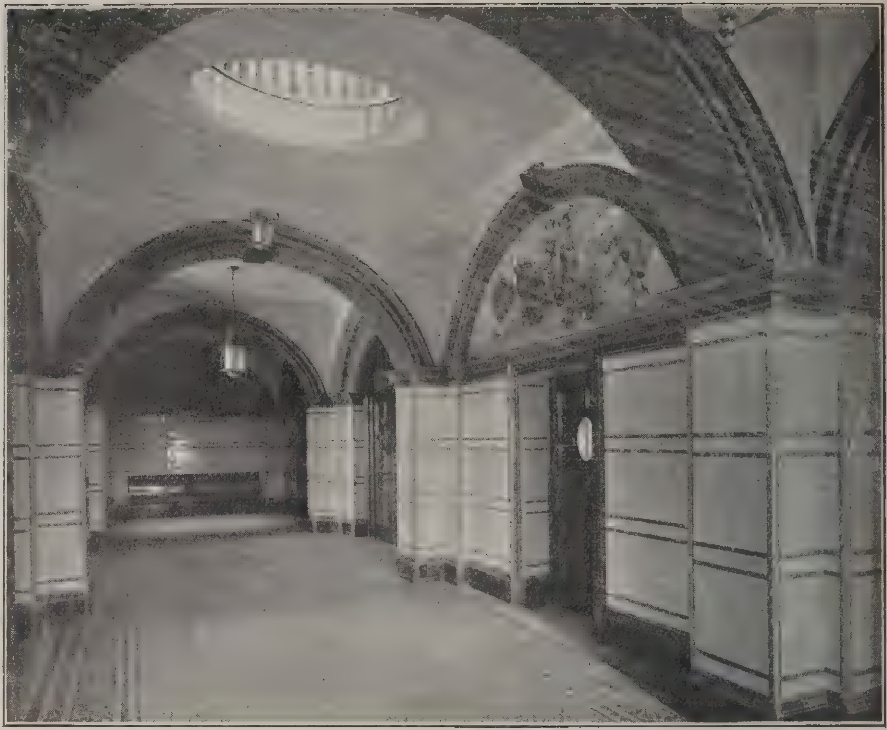
In a paper on sanitary and electrical requirements in hospitals, Mr. Charles T. Walrond, A.M.I.C.E., A.M.I.E.E., states that the drains should be small; branch drains short; trapped openings few; no trapped gulley in direct communication with the drain to receive rainwater or surface water; and iron drains provided with iron inspection chambers having airtight covers. Sinks and lavatory basins should be built into the wall, overflows dispensed with wherever possible, and floor channels adopted. (Page 37.)

The index to Vol. XX. is now ready and can be obtained from the Publisher post free for 1d.

A Standard Specification for Cement. THE Engineering Standards Committee continues its excellent work. The latest product of its labours is a standard specification for Portland cement, which has been needed for a long time by cement users and manufacturers. The Committee which drew up this specification consisted of a number of representative men. Mr. Lewis Solomon represented the Royal Institute of British Architects, and among other names we notice that of Sir John Mowlem Burt, of Messrs. John Mowlem & Co., the well-known firm of contractors, while the Associated Portland Cement Manufacturers, Ltd., were well represented. The specification stipulates for two tests—tensile strength and expansion. After cement has been bulked, samples are to be taken for testing from each parcel, either at the works or at the job. Before gauging for tests, the sample is to be spread out for a depth of 3ins. for twenty-four hours in a temperature of 58 to 64 degs. Fahr. Cement is not to be accepted for use unless previously certified in writing by the consumer to be of satisfactory quality after being tested and analysed, the cost being borne by the consumer. The cement is specified to be ground to the following degrees of fineness: (1) the residue on a sieve 76 × 76 (5,776 meshes per square inch) shall not exceed 3 per cent.; (2) the residue on a sieve 180 × 180 (32,400 meshes per square inch) shall not exceed $22\frac{1}{2}$ per cent. The specific gravity of the cement is not to be less than 3·15 when sampled at the works, nor less than 3·10 if sampled after delivery. Regarding the chemical composition, there is to be no excess of lime, *i.e.*, the proportion of lime shall not be greater than is necessary to saturate the silicia and alumina present, that is to say, the proportion of lime to silicia and alumina shall not be greater than the ratio 2·75. The percentage of insoluble residue is not to exceed 1·5, while magnesia is not to exceed 3 per cent. and sulphuric anhydride 2·5 per cent. This clause is somewhat doubtful in view of the present state of chemical knowledge, as it would appear from experiments made by Mr. Richardson in America (reported in our issues for September 14th and 21st) that not only does the ratio for Portland cement extend through very wide limits, greater than that here specified, but that the proportion of lime may be within the correct limits but not in proper chemical combination with the other elements, *i.e.*, there can be free lime present. Of course, the tests specified will guard against the free lime, but this clause seems rather superfluous in view of them. The quantity of water used in gauging is specified to be appropriate to the quality of the cement, and so proportioned that when the cement is gauged it shall form a smooth easily-worked paste that will leave the trowel cleanly in a compact mass. Fresh water is to be used, and the temperature in the room is to be from 58 to 64 degs. Fahr. The moulds are to be filled without mechanical ramming, the form of the mould being illustrated exactly. The briquettes are to be removed from the mould after setting and kept in a damp atmosphere for 24 hours, when they are to be placed in fresh water and allowed to remain until required for testing, the water being renewed every 7 days and the temperature thereof maintained between 58 and 64 degs. Fahr. Briquettes of neat cement are to be gauged for breaking at 7 and 28 days respectively, six for each period. The briquettes must bear at least 400 lbs. per square inch of section after 7 days and 500 lbs. after 28 days. The increase from 7 to 28 days is to be at least 25 per cent. when the 7-day test falls between 400 lbs. and 450 lbs.; 20 per cent. when between 450 lbs. and 500 lbs.; 15 per cent. between 500 lbs. and 550 lbs.; and 10 per cent. when the 7-day test is 550 lbs. or upwards per square inch. Tests are also to be made on briquettes prepared from 1 part cement to 3 parts by weight of dry standard sand (this sand to be obtained from Leighton Buzzard, to be thoroughly washed, dried, and passed through a sieve of 20 × 20 meshes and retained on a sieve of 30 × 30 meshes per square inch). Cement and sand briquettes are required to bear 120 lbs. per square inch after 7 days and 225 lbs. after 28 days, the increase from 7 to 28 days being not less than 20 per cent. Three distinct gradations of setting time are referred to—the setting time for "quick" cement is to be not less than 10 nor more than 30 minutes, for "medium" not less than 30 minutes nor more than 2 hours, and for "slow" not less than 2 hours nor more than 5 hours. The cement is considered as set when a needle having a flat end $\frac{1}{16}$in. square, and weighing $2\frac{1}{2}$ lbs., fails to make an impression when applied gently to the surface. The second test, referred to as the Le Chatelier method, is conducted firstly by filling a small split metal cylinder 30 millimetres diameter and 30 millimeters high, placing it in water at a temperature of 58 to 64 degs. Fahr., leaving it there for 24 hours, and measuring the distance apart of the two indicator points attached on either side of the split; and, secondly, placing the mould in cold water, bringing it to boiling point in 15 to 30 minutes, keeping boiling for six hours, and finally, after cooling, again measuring the distance between the indicator points. The difference between the two measurements represents the expansion of the cement, which must not exceed 12 millimetres after 24 hours aëration and 6 millimetres after 7 days aëration. The price of the report is 2s. 6d. nett.

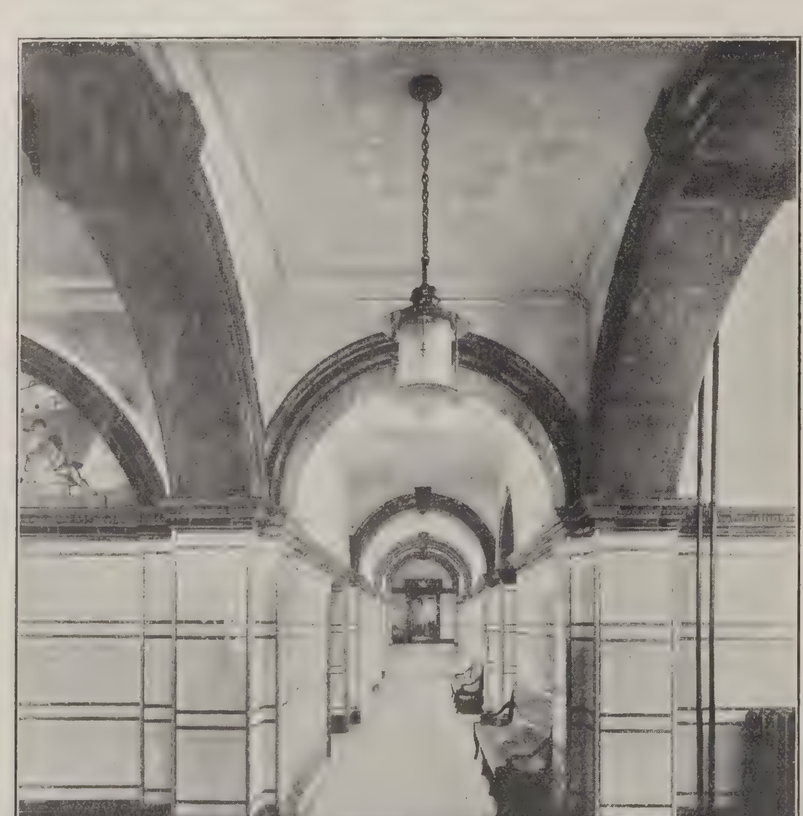
DAVID LEWIS WORKMEN'S HOSTEL AND CLUB, LIVERPOOL.

THIS building has been completed recently from designs by Mr. J. Francis Doyle, the well-known Liverpool architect, out of moneys bequeathed to Mr. B. W. Levy (of London) and Mr. G. J. Cohen (of Sydney, Australia) by the late Mr. David Lewis, of Liverpool: the object being the provision of a workmen's home and club and public hall, very much on the lines of the Rowton houses in London, though in these houses there is no such large hall as that provided in the building here described and illustrated, nor of course are there so many clubrooms. Its advantages are manifold, comprising clean and wholesome boarding-house accommodation at a low rate, a social club, reading- and billiard-rooms, facilities for educational improvement, physical development and so forth.



MAIN ENTRANCE HALL.

The building has a main frontage of 174ft. to Great George Place, a side frontage of 146ft. to Nile Street, and a back frontage to Rathbone Street. The main outer walls are of brick and terra-cotta and the roof is covered with green slates. The main entrance from Great George Place is 12ft. wide and leads to a spacious entrance hall, 50ft. by 20ft. (see plans in centre plate), arched and finished with tiles and faïence, from which access is given to the public hall. This latter is 90ft by 42ft. and 35ft. high, and supplies a real want in the south of Liverpool. It accommodates about 800 persons and is complete with stage, green-rooms, boxes and gallery. Ample exits are provided (there being no fewer than eleven) and a foyer extends over the main entrance hall. Enclosing the public hall, on one side, are the several rooms for the social club, comprising, on the ground floor, a billiard-room 67ft. by 30ft., a club-room 50ft. by 26ft., a committee-room and a toilet-room, with other club- and committee-rooms on the first floor, and still another large club-room in the basement. On this side of the site, space has been left for the erection of a gymnasium 132ft. by 54ft.



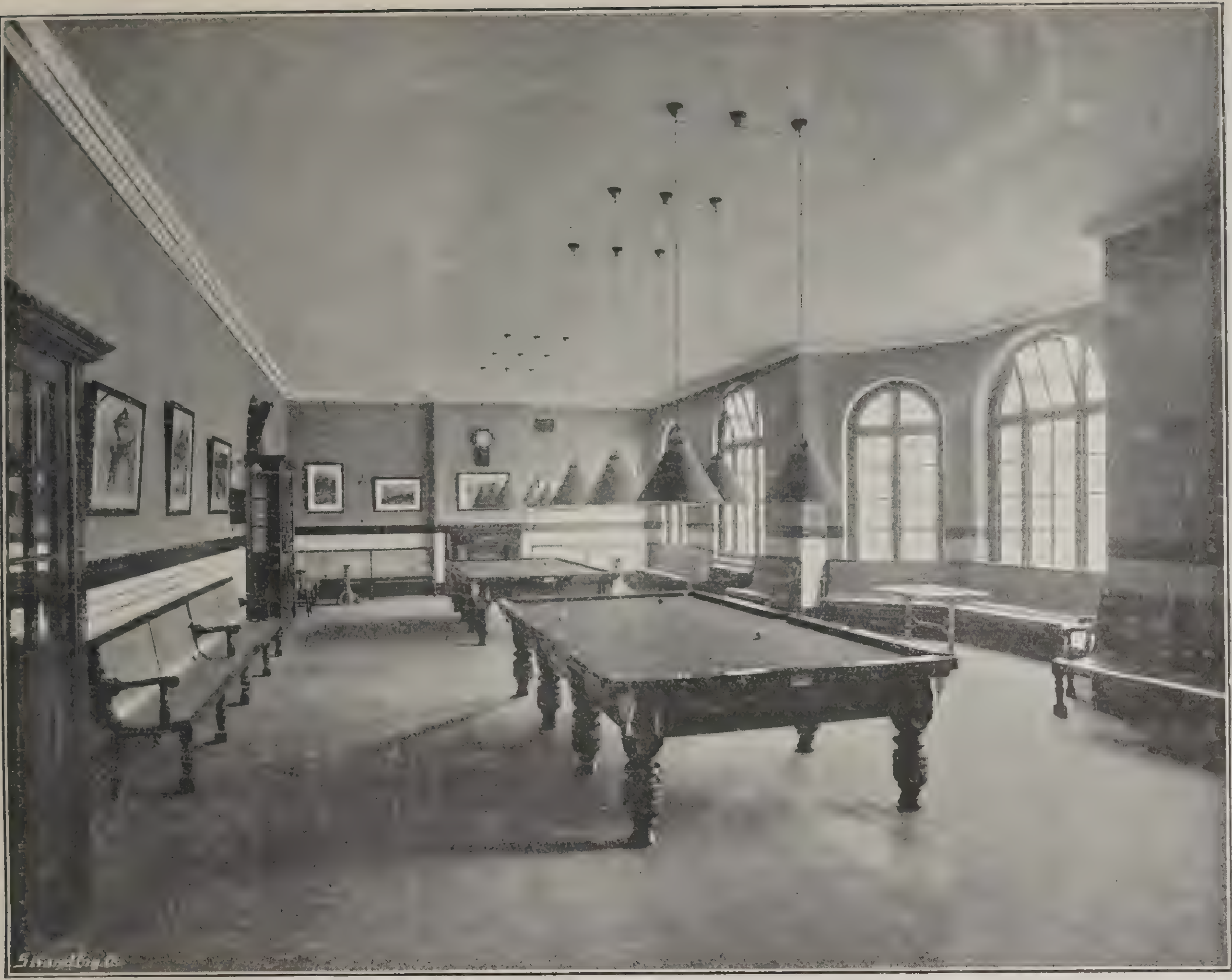
BILLIARD-ROOM CORRIDOR, GROUND FLOOR.

The workmen's hostel, or home, is entered from Nile Street through turnstiles, as at the Rowton houses in London and elsewhere. At the side of the entrance is an office, with the superintendent's house adjacent. There are wide halls and corridors, and the main staircase, of fire-resisting construction, is 21ft. square, with a hall 21ft. by 20ft. Leading off this is a reading-room 50ft. by 20ft., and between it and the dining-room is a provision shop 20ft. by 15ft. connected by lifts with the kitchen, sculleries, pantries and stores in the basement. The dining-room measures 80ft. by 41ft. and has a brick dado: two ordinary fireplaces are provided, as well as a special cooking fire and a lodgers' scullery, and every appliance conducive to comfort and cleanliness.

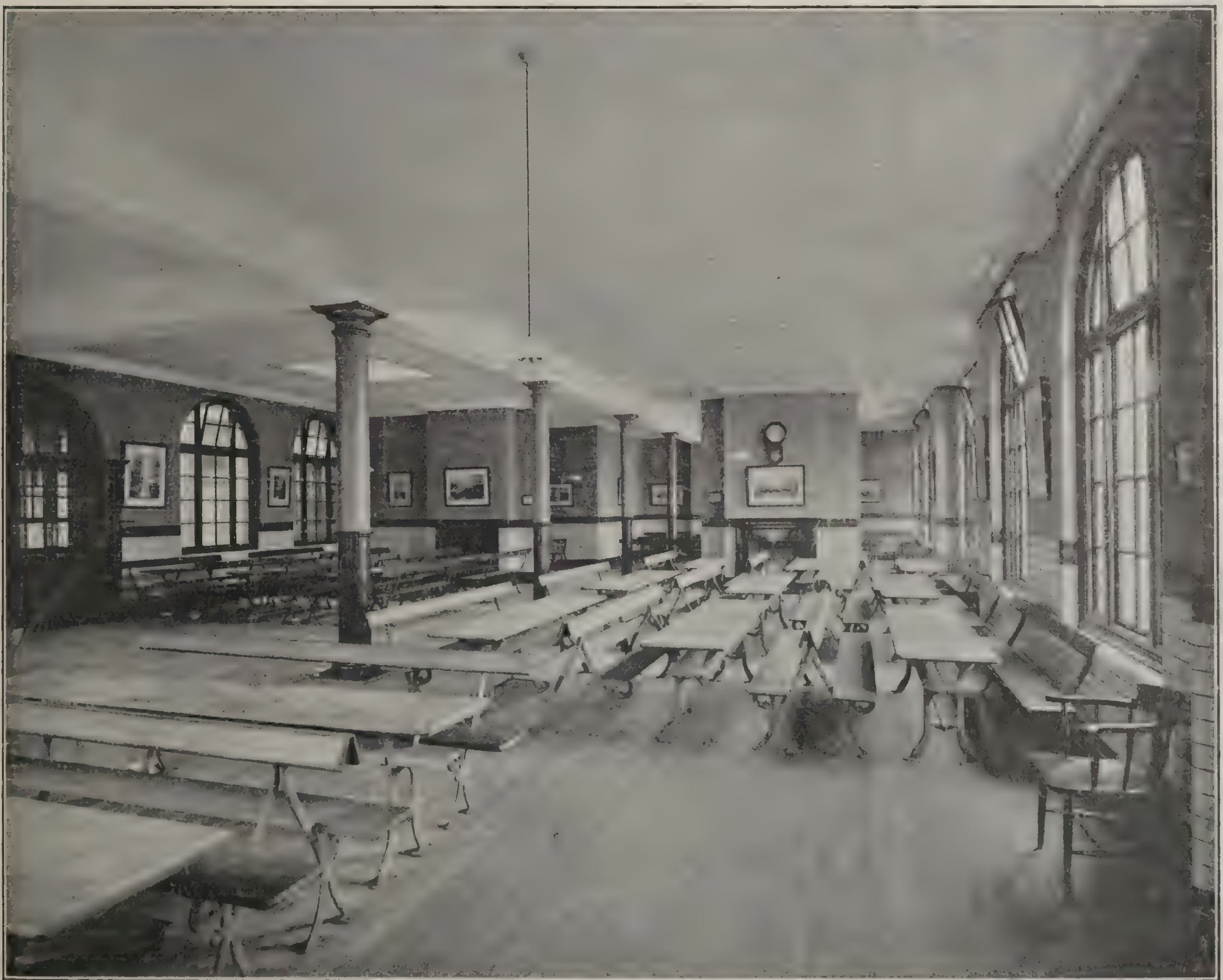
On the upper floors of the building, and approached from the large main staircase by three independent gangways, are the sleeping cubicles; two other stone staircases for emergency are also provided. In all there are 400 cubicles, arranged in groups for easy working and control. Numerous appliances for extinguishing fire are fixed throughout the building.

Over the billiard-room is a large flat, used by men who sleep in the home, and who are thus afforded the opportunity of getting fresh air under agreeable conditions. The club is not only used by lodgers, but also, under certain regulations, by the inhabitants of the locality. According to present intentions a charge of 6d. each per night is made to the occupants of the cubicles, who are also afforded the accommodation of the club, provided they behave themselves. Large lavatories are placed in the basement. The heating, ventilating and electric-lighting arrangements are thoroughly up-to-date. Mr. Isaac Dilworth was the builder, Mr. J. W. Gilling being the clerk of works, and, on his death, Mr. A. C. Leat.

The total cost of the building, including site and furnishing, has been £100,000. It will be seen to be most conveniently planned, while the embellishment of the interior with tiles and faïence, as the accompanying photographs show, is admirable.



Billiard-room.



Dining-room.

DAVID LEWIS WORKMEN'S HOSTEL AND CLUB. LIVERPOOL. J. FRANCIS DOYLE, ARCHITECT.

DAVID LEWIS WORKMEN'S HOSTEL AND CLUB, LIVERPOOL: FOYER, FIRST FLOOR.

Views and Reviews.

Longman's Building Construction.

The latest editions of the first two parts of Longman's Notes on Building Construction, formerly known as Rivington's, are a considerable improvement on previous editions. Whereas subjects were dealt with in an elementary way in the first volume, and further elaborated in the second, they have now been collected together so that joinery for instance may be found thoroughly treated in consecutive order in volume ii., while the subjects of walling and arches, brickwork, masonry, carpentry, roof coverings and constructional ironwork are found to be treated comprehensively in part i. This is a great advantage, for it gives a student a thorough grasp of each subject in all its bearings. The old method was traceable to the South Kensington syllabus, to meet which the work was originally designed, and was one of the chief faults of the system. The examinations have in the last two or three years been improved, and the text-books have had to follow suit. Longman's, notwithstanding the several books on construction which have been brought out, remains the best. The work is characterized by lucidity and scientific grasp of essentials, and reasons are carefully set forth and lessons drawn therefrom, wherein most other books are deficient. The chief criticism of the book must be that the revision has not been thorough enough in view of the advance in knowledge and methods in recent years. Engineers, physicists, chemists and others have added much to our store of knowledge that the building trade student of to-day ought to be instructed in. The volumes would be better rewritten—revision, however thorough, is not sufficient. The separation of information on materials into another volume prevents the proper development of the subject, as also the subject of calculations and stresses and strains to part iv. The editor has at last recognized the importance of the subjects of drainage, sanitary fittings, heating and ventilation, electric and gas lighting, electric bells, telephones and lightning conductors and has included chapters on these in part ii. These chapters are good so far as they go, but do not go far enough. The chapter on fireproofing systems is mostly out of date; some of the descriptions of systems could be eliminated and numerous others included. The whole subject of reinforced concrete is neglected.

"Notes on Building Construction," Parts I. and II. New editions, 1904. London: Longmans, Green & Co., 39, Paternoster Row, price 10s. 6d. nett. each.

"Mechanical World" Pocket Book for 1905.

With the current issue this useful pocket-book, now in its eighteenth year, is further enlarged. A table of trigonometrical ratios and formulæ, a section giving the squares, cubes and fourth powers of fractions, and a collection of powers, roots and reciprocals of factors often required for engineering calculations have been added, the matter on ball bearings has been revised, and additions have been made to the steam boiler and other sections. It is exceedingly cheap.

"The Mechanical World" Pocket-Diary and Year Book for 1905. Manchester: Emmott & Co., Ltd., New Bridge Street, price 6d. London Office: 118, Chancery Lane, W.C.

House Painting.

One generally has a prejudice against the small books published at a cheap price in blatant covers with catchy titles that pretend to instruct the public to do their own house-repairs as well as any trained craftsman, because for some reason they are usually written either by a journalist having only a smattering of the subject, who "cribs" his facts from some more or less antiquated technical book, and who is generally devoid of common-sense, or by workmen whose methods of expression are ambiguous in the extreme and whose attempts at "style" are elephantine, and whose colloquialisms and smart sayings betray inherent vulgarity. This present book, though it is intended for the same public—the small householder, the tenant and the farmer—does not, we are happy to say, suffer from these faults. It is well and clearly written and the instruction is on the whole practical and all that is necessary. The book is worthy of a better cover.

"The Popular Guide to House Painting, Decoration, Varnishing, Whitewashing, Colour Mixing, Floor Finishing, Paperhanging, &c.," by Herbert Arnold. Manchester: John Heywood, Deansgate and Ridgefield. London: John Heywood, 29 and 30, Shoe Lane, E.C., price 1s. nett.

Lockwood's Price-Book.

The 1905 edition of this hardy annual has just reached us. To the careful revision which each edition undergoes is to be traced its continuance in the favour of architects and builders alike. The classification of the work is most clear and the get-up pleasing, while the information given is most complete and easy of reference. It has often surprised us to find the estimating clerks to large firms of builders using price-books several years old. This in inexcusable considering the moderate price of "Lockwood's." Builders ought to pay more attention to se that their reference books are up to date for the expense is trifling and their valu inestimable—not only is the time of assistant saved, but money also, far exceeding th cost of the books. Failure is often traceabl to antiquated methods of estimating, &c that arise from a neglect of these obviou and seeming trifles.

Lockwood's Builder's, Architect's, Contractor's an Engineer's Price-book for 1905," edited by Franc T. W. Miller, A.R.I.B.A. London: Crosby Lockwoo & Son, 7, Stationers' Hall Court, Ludgate Hill, price 4s

DAVID LEWIS WORKMEN'S HOSTEL AND CLUB LIVERPOOL: CLUB-ROOM, GROUND FLOOR.

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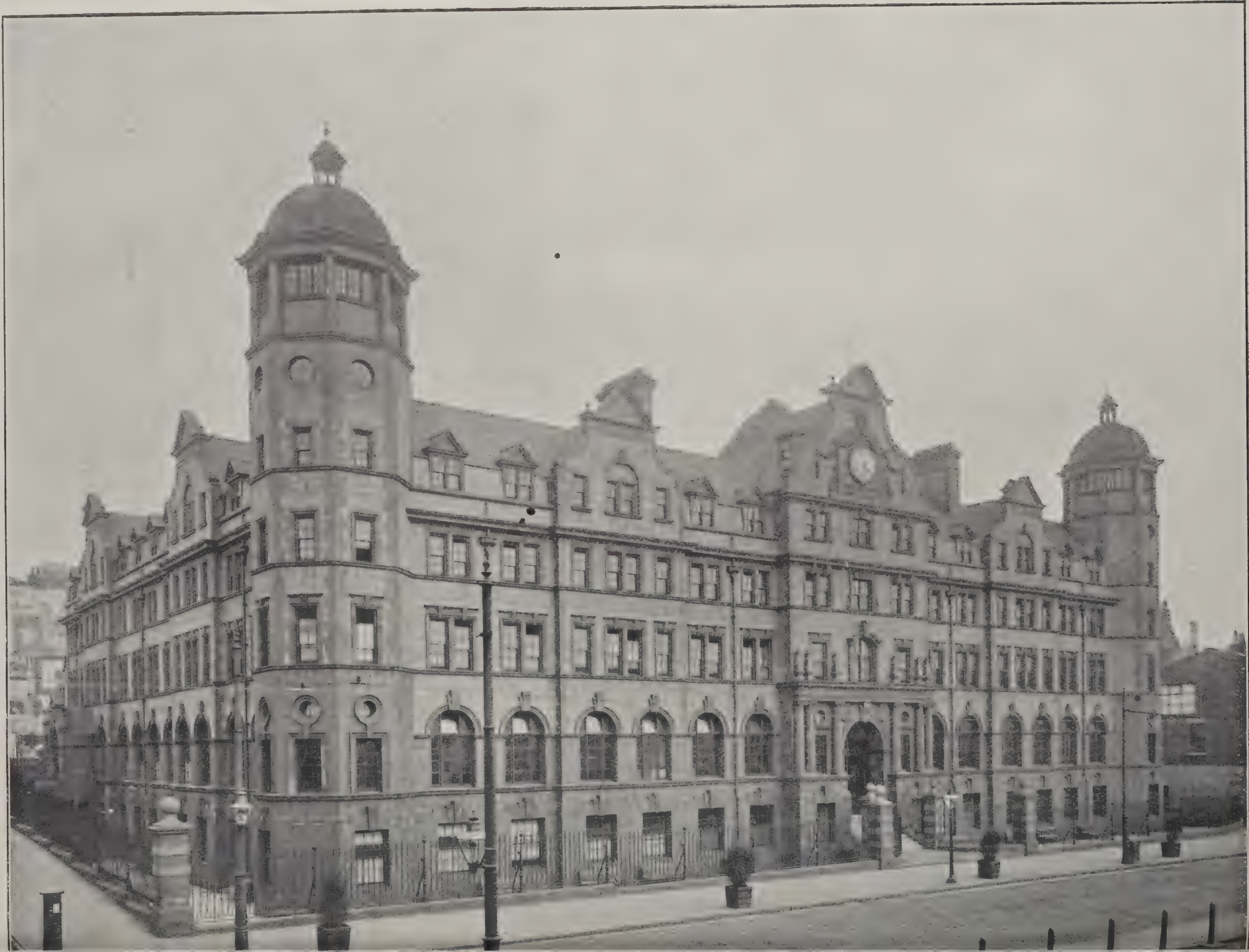
Wednesday, January 18th, 1905.



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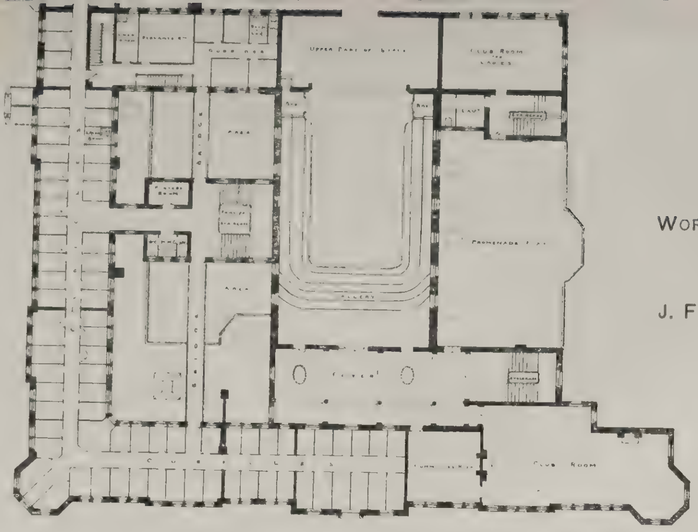
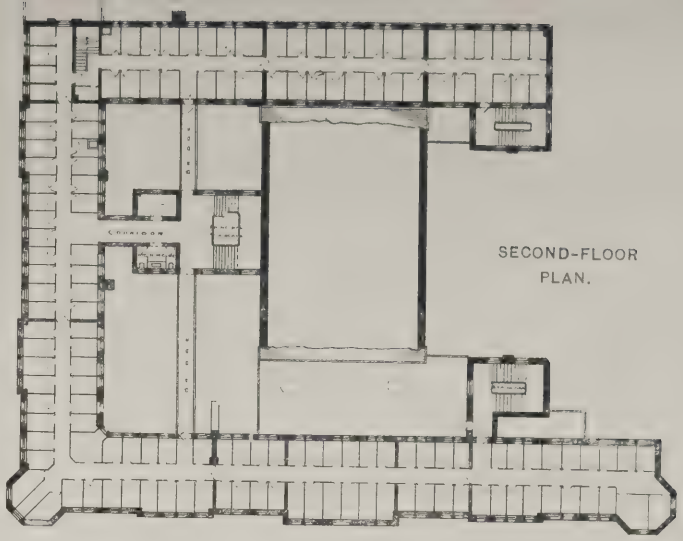
LIVERPOOL.

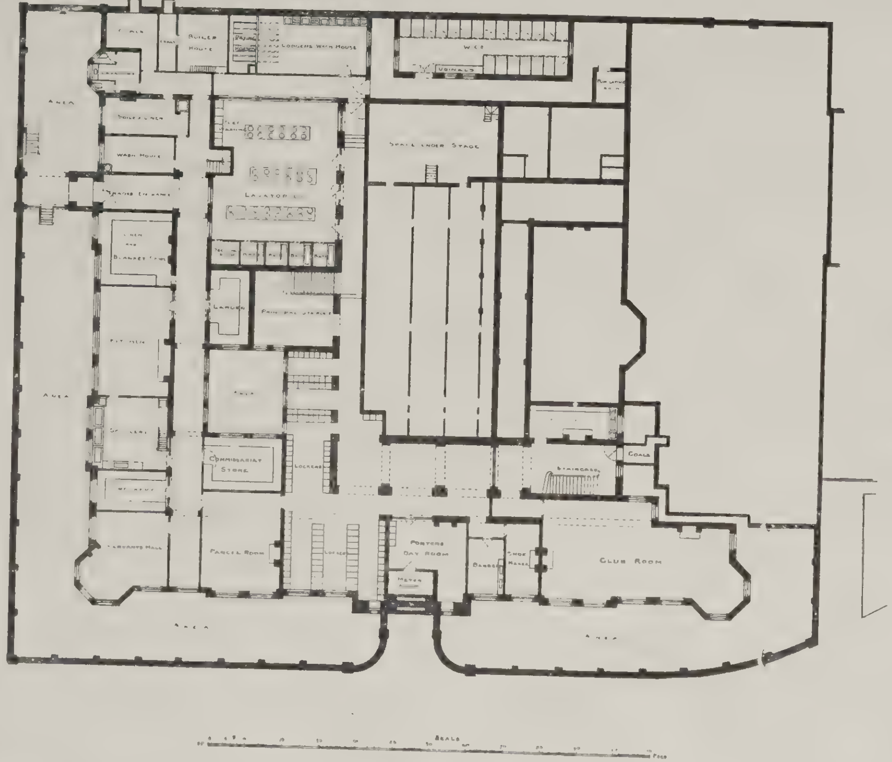
J. FRANCIS DOYLE, ARCHITECT.



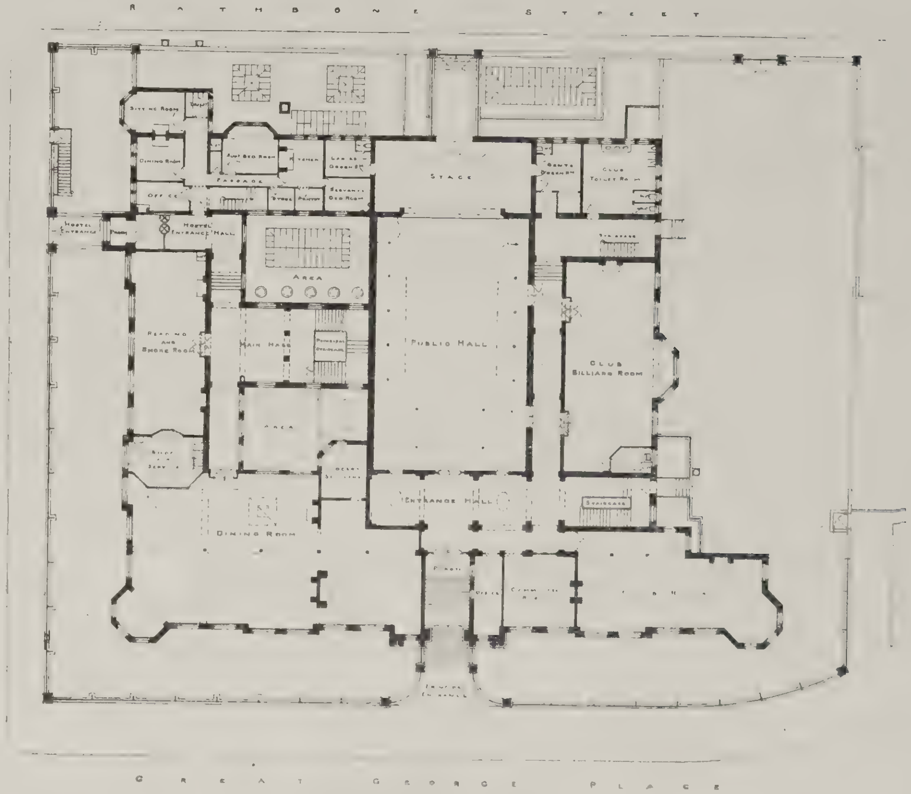
FIRST-FLOOR PLAN.



SECOND-FLOOR PLAN.



BASEMENT PLAN.



GROUND-FLOOR PLAN.

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LAW OF EASEMENTS.

A PAPER on this subject was read by Mr. Horace Wilson before the Sheffield Society of Architects and Surveyors last Thursday.

An easement, he said, imposed on the owner of the land subject to it only a duty to suffer something or refrain from doing something for the benefit of his neighbour; for example, the grantor of a right of way was only bound to allow the use of the way, not to keep it in repair; and similarly in the case of ancient lights he was only obliged to refrain from obstructing the light. The most important easements were those in respect of the right to support of land by adjacent and subjacent soil, the right to the use of drains and party-walls, and the right to light and air.

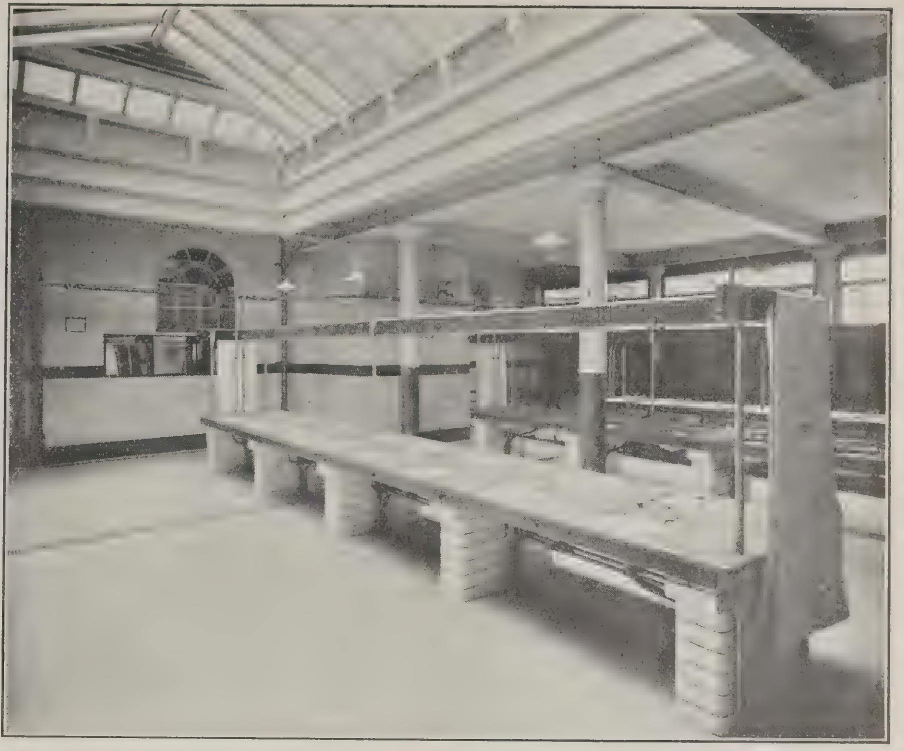
Excavations.

No man could, as a general rule, excavate in his own land, or work minerals, in such a way as to cause his neighbour's land to fall in; but the obligation to support as against adjoining land bound only so much of it as was necessary to support the land in its natural state. Nor did the right to support from subjacent soil prevent the adjoining owner from draining his land as he pleased. Neither of these rights was a right to have the whole or any part of the adjacent or subjacent soil left in its natural state, but simply a right not to have one's land injured by anything done, however carefully, in the adjacent or the under-lying soil. And this right, in its turn, might be subject to an easement in the adjoining owner to work in his land so as to cause a subsidence.

With regard to the right to

Support of Buildings

the main principle was that when anything had been done to increase the lateral pressure, as by erecting buildings, no man had a right to such increased support except for "ancient" buildings, *i.e.*, buildings at least twenty years old, for which the support had not been acquired by fraud, stealth, or the mere revocable permission of the servient owner. A grant of land, however, for the express purpose of building upon it created a legal easement to such an extent as might be necessary for enabling the grantee to build the premises and enjoy them in safety when properly built, but the owner of the house was not entitled to do anything to increase the burden on the other owner, and was bound to keep his house in repair. Again, the right to support of buildings by buildings might be acquired by prescription, provided that the adjoining owner was aware from the very nature of the building that support to it was necessary. An action would be for damage caused to a neighbour's building by negligence in law, but not always for negligence in fact; in other words, if there existed an easement of support, and the adjoining owner invaded that right, he would be liable in damages, however carefully he might have done the act complained of, but if not he would not be liable if he took proper care in the execution of the work.



DAVID LEWIS WORKMEN'S HOSTEL AND CLUB, LIVERPOOL: LAVATORIES IN BASEMENT.

Use of Drains.

The right to the use of drains now depended on the Public Health Act, which entitled every person within the district of a local authority to empty his drains into their sewers, upon complying with their requirements, and it provided a means of compelling local sanitary authorities to make a proper system of sewerage for their respective districts. The local authority was, under the Act, the sole judge of what was necessary for the proper construction and repair of all drains within its district. The Act gave very wide powers as to sewers, and the operations of local authorities in these matters too often had the evil results of causing persons whose lands were injuriously affected either to make unreasonable claims for compensation or to incur the expense, delay and annoyance of arbitration under the Act.

Easement of Light.

As to this, Mr. Wilson traced the alteration of the law under the influence of modern town life, and pointed out the tendency of the courts to restrict the easement to such an amount of light as was actually necessary for the user of the particular premises, rather than to confer a right to the continued enjoyment of all the light that had formerly had access to the building. The "45 degrees rule" was at first very much favoured, but it seemed to have fallen upon evil times latterly, and had recently been declared, in the Court of Appeal and the House of Lords, to be worth very little as a guiding principle.

DAVID LEWIS WORKMEN'S HOSTEL AND CLUB, LIVERPOOL: THE PUBLIC HALL.

An Historic Lincolnshire Tower.—The tower of St. Andrew's Church, Denton, near Grantham, was reopened last week after thorough restoration by Mr. William Weir, for the Society for the Protection of Ancient Buildings. The tower was built between 1350 and 1400 and is in the style transitional between Decorated and Perpendicular. A broad belt of brickwork has been built in the interior, the exterior has been re-pointed, the vane and pinnacles renewed, a lightning conductor placed in position, and the clock re-gilded. The cost has been about £900.

Keystones.

New Technical School, Burnley. — Mr. Pickles, borough surveyor of Burnley, has been appointed architect for this building at a fee of £600.

The new Associates of the Royal Academy will be elected this week from a list of 93 painter candidates, 17 sculptors and 39 architects. There is only one new candidate among the architects—Sir William Emerson.

New Premises for the Masonic Club at Norwich are to be erected at 47, St. Giles' Street from designs by Mr. Albert C. Havers, of Norwich (who was selected in local competition recently). The front elevation is Classic in character and will be carried out in Monk's Park stone and Portland stone.

Royal Gold Medal, 1905.—At the meeting on February 6th the Council of the R.I.B.A. will announce the name of the person they propose to submit to His Majesty the King as a fit recipient of the Royal Gold Medal this year. Members may submit names to the secretary up to January 23rd.

Municipal Architecture: R.I.B.A. Memorial.—At a meeting of the Watch Committee of the Birmingham Town Council last week the memorial from the R.I.B.A. and allied societies urging that architectural work should not be placed in the hands of engineers or surveyors was received, and referred to sub-committees.

Competition Reform Society.—The Committee disapprove of the conditions in the competition for a public elementary school at Preston, because the remuneration offered to the successful competitor is 5 per cent., including quantities. Members are requested to abstain from competing unless the conditions are satisfactorily revised.

Caversham Schools Competition. — The R.I.B.A. have been in communication with the Oxford Education Authority in regard to the conditions of this competition, which are unsatisfactory; the Authority, however, will only modify them to the extent of not requiring a detailed specification separate under the several trades to be sent, so that architects will do well to refrain from competing.

Henry Saxon Snell Prize.—The Royal Sanitary Institute has issued the general conditions for this prize, which was founded to encourage improvements in the construction or adaptation of sanitary appliances, and is to be awarded by the Council of the Institute every three years, funds having been left for that purpose by the late Mr. Henry Saxon Snell, F.R.I.B.A. The first prize, which will consist of £50 and a medal of the Institute, is offered this year for an essay of not more than 5,000 words on "Domestic Sanitary Appliances, with suggestions for their improvement," which is to be delivered by March 30th addressed to the secretary of the Royal Sanitary Institute, 72, Margaret Street, W., from whom all particulars can be obtained.

Alexander Thomson Travelling Studentship. This triennial studentship (value £60, and open to architectural students between 18 and 25 years of age residing in the United Kingdom) is to be again competed for this year, the drawings having to be submitted by December 28th. The subjects are (1) a study of a classic building (if specially prepared for the competition the subject is to be the Monument of Lysicrates) and (2) a design for a cascade and portico in a public park. The successful competitor is required to go on a sketching tour for three months, and the competitor placed second to spend three weeks in making drawings in the British Museum or elsewhere. Full particulars can be obtained from Mr. C. J. MacLean, secretary to the Trust, 115, St. Vincent Street, Glasgow.

A new Mortuary for Edinburgh is proposed to be erected at High School Yards at a cost of £4.000.

Northern Architectural Association.—Mr. J. Walton Taylor's presidential address, delivered on November 22nd last, has now been issued in pamphlet form.

The Decoration of a New Club was under discussion, when a member suggested the style might be Early Pullman or Late North German Lloyd!

A new Board School at Bathgate, Edinburgh, has been erected from designs by Mr. J. Graham Fairley, architect, of Edinburgh. It is two storeys high and has eight classrooms accommodating 480 children. On each floor is a hall 60ft. by 26ft. for drill and music lessons. The cost of the building has been £9,500.

R.I.B.A. Prizes and Studentships.—The annual exhibition of designs and drawings submitted for the R.I.B.A. prizes and studentships will be held, as usual, in the gallery of the Alpine Club (entrance in Mill Street, Conduit Street, W.), from Tuesday next, January 24th to Saturday, February 4th, from 10 to 8. The awards will be announced at next Monday's meeting of the Institute, and will be published in our issue for Wednesday next. The following works have been received:—Essay, 14; Institute Silver Medal, 17; Soane, 12; Owen Jones, 3; Pugin, 7; Godwin Bursary, 1; Tite, 19; Arthur Cates, 2; Grissell, 5.

Rural By-laws: Presentment to Mr. Justice Grantham.—At the Cambridge Assizes on Saturday the grand jury made a presentment to Mr. Justice Grantham, expressing their thanks to his Lordship for the determination with which he had brought before the country the many and great obstacles thrown in the way of cottage building in country districts by impracticable and unnecessary by-laws, and by the arbitrary way in which they were sometimes administered by those in authority. They trusted that the President of the Local Government Board would at an early date take such steps as might be necessary to remove those obstacles.

Victoria Station Front: A Protest.—In a letter to the "Times" the Architectural Vigilance Society protest against the proposed new front to Victoria Station. The following names are subjoined:—Lord Windsor (chairman), Lord Balcarres, Sir Edward J. Poynter, Sir W. B. Richmond, Mr. G. J. Frampton, Sir Aston Webb, Mr. W. D. Caröe, Prof. Beresford Pite, Mr. Henry T. Hare, Dr. G. Longstaff, Mr. M. H. Spielmann and Mr. H. H. Statham (hon. secretary). The design for the new front has been prepared in the engineer's office and the Society consider it to be "a huge mass of architectural commonplace." They have been in correspondence with the secretary of the company with the object of getting the design revised so as to be worthy of its important position. "The contrast is illustrated in the design which has been made for the wall, &c., along Buckingham Palace Road. This, though simple, is in good architectural taste, and no complaint can be made against it. If the same hand were allowed to recast the station front design, we might have something very much better at even less cost." In reply the railway company state that one of the building contracts has been signed and it is impossible now to make any alteration, and they add that the design has been prepared under the supervision of the engineer by a competent and trained architect. (The whole of the works have been designed under the supervision of Mr. Charles L. Morgan, M.I.C.E., the company's engineer, who has been assisted in the architectural design by Mr. C. D. Collins, M.S.A., chief of the architectural staff.)

Builders' Notes.

Dissolutions of Partnership. — Messrs. Huggins & Mason, builders, of Plymouth, have dissolved partnership; also Messrs. Godfrey Brothers, builders and contractors, of Seaford.

The Pronunciation of "Plumber" has drawn the "Chronicle" thus into verse:—

Plumber—spelled just so—my plumber,
You complain; and really I'm
Puzzled, be it spring-time, sumber,
Autumn, winter—for your rhyme.

Cheery, necessary plumber,
Welcomb guest at any time,
Welcomber than any comber,
Tell me—how is that for rhyme?—C.R.

Building Trades' Exhibition.—Lord Windsor, First Commissioner of Works, has promised to open the Building Trades' Exhibition, which is to be held in the Royal Agricultural Hall, Islington, from April 27th to May 6th next. The date of opening was originally fixed for April 29th, but owing to the demand for space the date has been altered.

Exhibition of the Decorative Trades in Edinburgh.—In connection with the annual general meeting of the National Association of Master-Painters in Scotland, which is to be held in March next, it has been decided to hold an exhibition of the decorative trades in the Waverley Market, Edinburgh, to be open from March 8th to 11th. A similar exhibition was held at Manchester in September last, and proved a decided success.

City Corporation and the Building Acts Amendment Bill.—At last Thursday's meeting of the Court of Common Council a letter was read from the London County Council asking the views of the Corporation with regard to the London Building Acts Amendment Bill. Mr. Deputy Wilkinson denounced the proposed measure as unnecessary, unjust and absurd. Its proposals were unbusiness-like and would produce chaos, and if such a Bill ever became law it would be the ruin of half the householders in the City of London. It was resolved that a small committee, composed of members of the City Lands, Bridge House Estates and Streets Committees, should be formed for the purpose of taking all the necessary steps to oppose the Bill.

Obituary.

Mr. Arthur Hunt, a well-known young builder of Burgess Hill, was found drowned last Friday in the Victoria Pleasure Gardens.

Mr. Thomas Fenwick, one of the best known civil engineers of the North of England, partner in the firm of Martin & Fenwick, Leeds, died last week, aged 80.

Mr. James Wiggins, of the firm of Wiggins & Co., lime and cement merchants, Hammersmith, who died on October 16th last, left estate which has been valued at £20,801.

Mr. John Williams, one of the veterans of the Newport (Mon.) building trade, died last Thursday in his eightieth year. He had been in Newport about sixty years, and in business as a builder and stone merchant about forty-three years.

Mr. Whitworth Whittaker, brickmaker, builder and contractor, of Oldham, who assisted in building the original railway station at Crewe and died on October 4th last, aged 80 years, left gross estate which has been valued at £90,079.

Mr. Thomas Fidler, builder and contractor, of Eckington and Sheffield, died on January 10th, aged 67. His firm—Messrs. James Fidler & Co., Ltd.—has built numerous churches and chapels and many important buildings in Sheffield, including the Lodge Moor Hospital: and is now engaged in erecting the new University College.

Electrical Notes.

The London Power Bills.

Ve referred a few weeks ago to the pro-
ed schemes for the supply of electrical
rgy in bulk to London borough councils,
ch schemes are to be brought before Par-
nent next session. In no country in the
:ld except this would there be tolerated
waste of time and of ratepayers' money
the part of opposing municipalities that
ains whenever any scheme of benefit to
community, but involving private enter-
e, is brought forward. As a consequence
the notice about the new Bills, a con-
nce of the London borough councils was
l last Wednesday at the Shoreditch Town
ll, at the invitation of the borough council
that ilk, "to consider what joint steps
uld be taken to oppose the passing into
of the proposed Bill of the Administra-
County of London and District Electric
ver Co., and other similar Bills affecting
ıdon boroughs, to be introduced in the
ııing session of Parliament." It will be
erved that these bodies do not meet to
sider the principle of opposition; that is
article of faith amongst municipalities.
first a resolution was moved "that this
ference do combine in a joint opposition
he following Bills,' &c., the mover being
chairman of the Shoreditch Electricity
nmittee; but no seconder could be found.
dently some of the delegates seemed to
e qualms about the advisability of spend-
ratepayers' money in opposing Bills that
not affect their own boroughs, and this
nion was voiced by the town clerk of
olwich and several others. Ultimately
resolution was altered and agreed to in
amended form, and to the effect that
y those borough councils affected should
ıtly oppose. Then the Shoreditch borough
:trical engineer moved that an executive
ımittee should be appointed to conduct
joint opposition, and the final motion put
ı cut-and-dried form the constitution and
ies of the committee, great caution being
iously taken in the wording. Then the
reditch town clerk got up and moved
hat it be referred to the executive com-
tee to consider the advisability of formu-
ng a municipal scheme for a large
erating station in the most favourable
ition for supplying electricity in bulk to
sting municipal electricity undertakings."
s audacious proposal, calling in mind
object of the conference, was even too
ch for the delegates, and was strongly
osed by the Woolwich town clerk, who
nted out that they were asked to do
very thing which it had already been
ermined they should ask Parliament not
allow a company to do. He regretted
resolution, "as it would undoubtedly
l its way to the knowledge of the pro-
ters of the Bills and be used against them
the committee rooms." No doubt it
l, and we hope with success. Finally this
lution was withdrawn. Other resolutions
unimportance were passed, and this
itantly municipal conference was also
ed to include in the measures to be opposed
London Gas Bills and the Pneumatic
patch Company's Bill, but these pro-
als were ruled out of order. It is really
lisgraceful scandal that such advantages
he community as cheaper electrical energy
t can be supplied by the small municipal
ions should be opposed simply in the
erest of a fad. But so long as borough
ncils are composed of the class of men
v returned—or, to put it another way,
long as the ratepayers will put up with
sort of thing, and not return capable
n of business—so long we suppose will
remain behind every other large city
foreign countries, where neither muni-
alities nor vested interests have the power
evil possessed here. A.M.I.E.E.

Law Cases.

Architects' Offices: Interesting "Light" Case.—In the King's Bench Division of the High Court of Justice on Saturday the case of *Ambler* v. *The Bishop of Leeds* was heard. The plaintiffs were the owners of a block of property in Cookridge Street, Leeds, and it was contended that by the erection of the new Roman Catholic Cathedral opposite, the light to the plaintiffs' premises had been materially diminished. Evidence showed that the light to the ground floor had been altered, but with regard to the first floor, which was occupied as an architect's office, the matter was in dispute. The umpire, however, to whom the case had been submitted, held that "notwithstanding the defendant's buildings, there remains sufficient light to the plaintiffs' premises for all purposes of ordinary user, and the plaintiffs are not entitled to damages for interference with such ordinary user, but if I am entitled to take into account the damages which the plaintiffs have sustained in respect of loss of light to those parts of the said premises used for occupation in which a special amount of light is required, then I award £600 damages to be paid by defendant to the plaintiffs." The umpire added that "at the request of both parties I submit for the opinion of the Court above whether, on the foregoing facts, I am bound by the decision in *Home and Colonial Stores* v. *Colls*, and therefore cannot award damages to the plaintiffs, or whether I can award damages in respect of interference with such special user of light as aforesaid." The point the plaintiffs wished to raise was whether or not an architect occupying premises and only requiring such an ordinary amount of light as any ordinary architect needed was entitled to have his business included within the category of special businesses.—Mr. Justice Day reserved judgment.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

THE annual dinner of the Leeds and Yorkshire Architectural Society was held on Thursday last, the president (Mr. G. Bertram Bulmer) occupying the chair.

In proposing the toast of the Royal Institute of British Architects Dr. Bodington (vice-chancellor of Leeds University) said it was seventy years since the first meeting of the Society of British Architects was held; the first president (Earl de Grey) was not a professional man, but one of those amateurs who were useful intermediaries between the expert man on the one hand and the outside world on the other. Speaking of the architecture of cities, Dr. Bodington said he thought it was greatly to the credit of the London County Council that in a place where land was so valuable those two precious churches of St. Clement Danes and St. Mary's, Strand, should have been spared, and that they should see them unencumbered and unhampered by buildings. He would be very glad to see municipal authorities having more control over the height of buildings and more control over the character of the advertisements with which they might be beautified—or disfigured; he thought it likely that more attention would be paid by municipal authorities to the opinion of such bodies as the Royal Institute of British Architects and the Leeds and Yorkshire Architectural Society.

Mr. Alfred Darbyshire responded to the toast, and said that one of the wisest things the Institute had ever done was to open its arms to the brethren in the provinces. The question of the registration of architects he regarded as the most vital point that had arisen in the profession in his lifetime. The Institute must be the moving power in carrying this matter through the House of Commons.

The toast of "The Allied Societies" was given by Mr. W. J. Locke, who mentioned that in July next year London would be the scene of an international congress of architects.

In responding, Mr. J. W. Beaumont spoke on the question of registration, and said that, whatever the decision of the Institute in the matter, he would abide by it loyally, believing that the decision—after the exhaustive enquiry into the subject—would be the correct one. He himself believed that registration would raise the status of the architect and would give him a position before the public.

The toast of "The Houses of Parliament" was proposed by Mr. Butler Wilson, who also devoted his remarks to the subject of registration. Mr. R. H. Barran, M.P., responded to the toast, and referring to this same matter said that if the Institute was unanimous in its support there was every reason why the Bill should go through, and every prospect that it would.

The Lord Mayor proposed "The Leeds and Yorkshire Architectural Society," and referred to the architectural transformation of Leeds in recent years. Mr. Bulmer replied, giving a sketch of the history of the Society from its inception in 1876 down to the present time.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

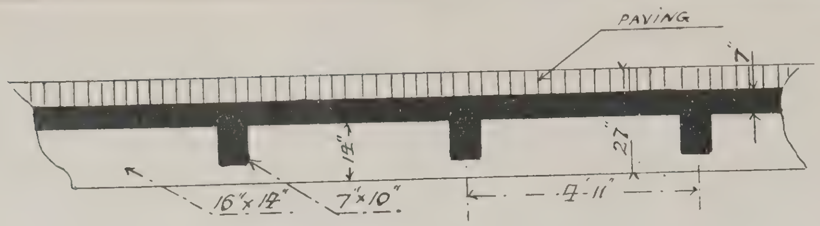
Best Books for R.I.B.A. Intermediate.

AYR.—SUBSCRIBER writes: "Which are the best books to study for the R.I.B.A. intermediate examination? I have a list, published by Batsford, of the books recommended by the Institute, but would like to know which are the most suitable. Is Taylor & Cresy's 'Rome' the best book to draw the Orders from? Which parts of Glasgow Cathedral would you advise me to measure for my Gothic sheets?"

The best books to study for the R.I.B.A. intermediate examination are as follows:—Banister Fletcher, "History of Architecture on the Comparative Method"; R. Phené Spiers, "The Orders"; John Perry's "Applied Mechanics" or Goodman's "Mechanics applied to Engineering"; Spanton, "Complete Course of Geometry" (large edition); Longman's "Notes on Building Construction," and separate books on various classes of materials, the names of which will be found in our book lists. The Orders might very well be drawn from Taylor & Cresy's "Rome," but it is an expensive work, and Spiers's "Orders" would give you all you require, unless you happen to have a copy of the former work. The R.I.B.A. list of books is not satisfactory. There are many fine doorways at Glasgow Cathedral and some excellent work in the chapter-house, but you will probably find that the choice of a subject for measuring is determined by the lengths of the ladders procurable at or near the cathedral.

Ancient Lights.

LONDON, N.—F. S. writes: "A has a building two floors high with ancient lights overlooking B's back garden. A pulls down his building and erects another, setting back the new one level with the old building, but at the same time A's new building is carried up another storey and new windows are also put in and the ancient ones enlarged. Has



MARKET-PLACE ON REINFORCED CONCRETE AT ROCHDALE.

B any claim on A? If it can be shown that B's property is decreased in value by A's building, has B a right to compensation? Can you name some books that deal with cases of this kind?"

By building along a new frontage line A has abandoned the right of light possessed by his old windows, and B may prevent him from acquiring a similar right for the new windows by erecting a permanent obstruction on his own land at any time within nineteen years from the date of their being opened. B has no claim whatever upon A, having no ancient lights which A has obstructed. Obtain Fletcher's "Light and Air" or consult Steven's "Commentaries." M.

Admiralty Engineers.

Sale.—Architect's Assistant writes: "In the examinations for Admiralty engineers does the student have to pass in both engineering and architecture, and if so what books would you recommend for the engineering papers?"

Architectural and engineering drawing being grouped together, it is only essential to qualify in the group as a whole. On the other hand, to merely aim at a "pass" in a competitive examination is one of the surest means of securing failure. On the present occasion about twenty-five candidates are competing for two vacancies. It is obvious that only the two men who obtain most marks can succeed, although probably fifteen out of the twenty-five will qualify in all the groups; and under such circumstances it is just as bad to be third, even if only two marks behind the second, as to be last on the list. Every single mark is of the utmost importance; therefore no subject can be neglected with safety. There is, however, no likelihood of another examination being held for a few years, so that there is plenty of time for studying engineering by the only proper method—practical experience. G. A. T. M.

Cost of Board Schools.

London, E.C.—L. A. H. writes: "In a list of approximate prices published in your columns some time ago you put Board schools at 6d. to 8d. per foot cube. Do you think a one-storey school could be erected near Reading at 6½d., with central hall for boys and girls, hall corridor for infants, and the minimum accommodation; all in general very plain?"

The average of twenty London Board schools on the basis of 8 sq. ft. per child came out at the rate of £17 13s. 9½d. per head. A one-storey Board school as described could hardly be built for less than 7½d. per foot cube, but it would depend upon circumstances. See Rea's "How to Estimate" (7s. 6d. from these offices) for many other particulars. HENRY ADAMS.

Workhouse Infimaries.

A Subscriber writes: "Is it possible to erect a workhouse infirmary at a cost less than £90 per bed, with administrative accommodation fitted up with modern sanitary accessories which will meet the requirements of the Local Government Board?"

According to Rea's "How to Estimate" the Axbridge infirmary for workhouse, Somerset, cost £5,720 in 1902 for sixty beds, or £95 per head; the Cannock infirmary for Board of Guardians, Staffordshire, in 1901, for forty-eight beds, £96 per bed; the Shipton infirmary adjoining the workhouse, in 1901, £4,300, or £90 per bed; the Solihull workhouse infirmary and tramp wards, in 1901, with eighty beds, £85 per bed; the St. Pancras infirmary, Highgate, built many years ago, £68 per bed (a very plain building, however). At the other end of the scale are West Ham, £277, and Willesden, £245 per bed. HENRY ADAMS.

"Market-place on Girders and Concrete."

Referring to the recent enquiry under the above head, and the reply of Professor Adams thereto, Mr. Cecil Cary Markham, civil engineer, of Darlington, draws attention to a work of similar nature recently carried out at Rochdale, where Mr. S. Sidney Platt, M.I.C.E., adopted ferro-concrete construction (Hennebique) for covering in the River Roch, with very satisfactory results. The accompanying part cross-section illustrates the method adopted. "This system," adds Mr. Markham, "has the advantage (1) of not offering any steel surface to be acted upon in a damp situation, thereby eliminating cost of upkeep, and (2) of being cheaper than the scheme outlined by Professor Adams. The contractors for the work were the Yorkshire Hennebique Contracting Co., Ltd., of North British Buildings, East Parade, Leeds."

Books on Engineering Drawing and Design.

Whitley Bay. — Inter writes: "Please name some suitable books for 'Engineering, Drawing and Design' in the London University Intermediate B.Sc. examination. Students are expected to be familiar with the principles of orthographic and oblique projection, and to answer simple questions upon colouring and shading, and upon arrangements and proportions of rivets, screws, bolts, nuts, flanges, plummer-blocks, brasses, &c. I am attending second stage machine draw ing, South Kensington, and supplementin it with private study. We use Low & Bevis' 'Machine Drawing,' but I desire a book t cover projection, colouring and shading."

The best text-books for any examinatio depend upon many circumstances, amon them being the aptitude of the student an the time at command. With sufficient tim the best book for this examination is Wells' "Engineering, Drawing and Design" (Griffi & Co., Exeter Street, Strand, vol. i. 3s vol. ii. 4s. 6d.). For the preparation drawings see "Class Notes in Technic Drawings" (Adams, 60, Queen Victori Street, 6d.) and "Draughtsmen's Work (Cassell & Co., 2s.). The books with illu trations of colouring and shading are a expensive. The best is Armengaud's, but is not often seen nowadays, as machi drawings are rarely finished in an artist manner. HENRY ADAMS.

Water Filter for 1,800 Gallons a Day

White Heather writes: "What wou be the best size and description of an econ mical and efficient filter for supplying 1,8 gallons of water per twenty-four hours? rough sketch of the construction would helpful."

The description of what is required is meagre that it is difficult to frame a usef reply. The whole circumstances should ha been stated as completely as possible. suming that ordinary river-water is to dealt with, and that there is convenience the construction of a sand-filter and app tenances, the arrangement might be as sho by the accompanying illustrations, Fig. being a plan and Fig. 2 a section. settling tank is required to get rid of grosser particles and the mud brought do in time of flood. The filter must be duplicate so as to allow of cleaning with stopping the supply, and a reservoir of pu fied water must be provided in order t pumping may be done in the daytime, thou filtering may proceed all night. Assumi a filtering capacity of 500 gallons per sq. per twenty-four hours, the area of each fi must not be less than $\frac{1800}{500} \times 9 = 32{\cdot}4$ sq. or say, 8ft. by 4ft. at the surface of the sa The walls may be of concrete and the arc of brick or concrete. A pump may st over the reservoir. HENRY ADAMS

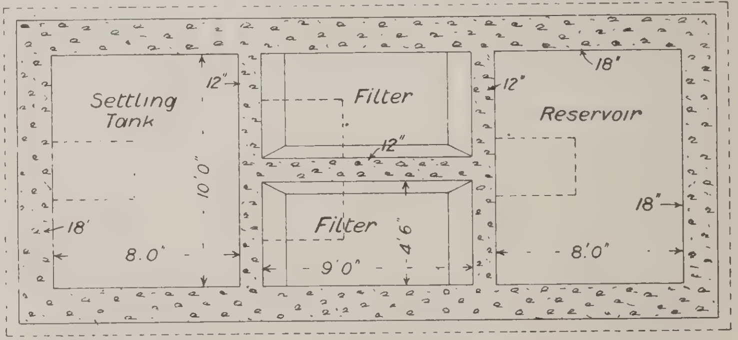


Fig 1

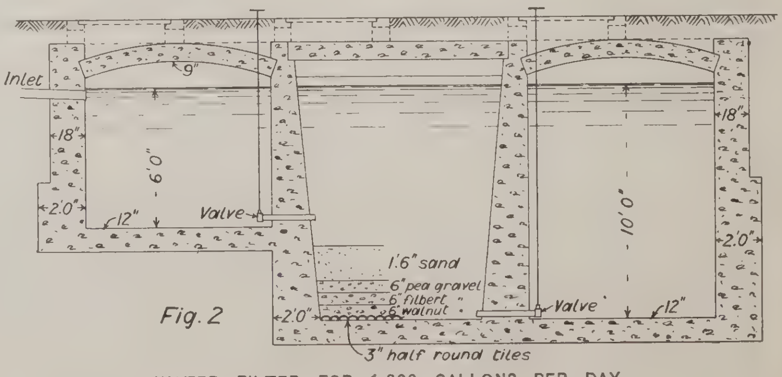


Fig. 2

WATER FILTER FOR 1,800 GALLONS PER DAY.

SANITARY AND LECTRICAL REQUIREMENTS IN HOSPITALS.*

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isulting Engineer to the Hospital for Sick ildren, Great Ormond Street, London, W.C.

SHALL first deal with the requirements of hospitals in respect of water supply. e great majority of the London hospitals dependent for their supply of water upon or other of the eight London water comnies, and we may therefore in the first tance consider whence this water is obned and how it is treated before it is ivered at the hospital.

Thames Water.

The water which is abstracted from the ames is taken from the river in the neighurhood of Hampton, Sunbury and West lesey, and is in the first instance passed o subsidence reservoirs, where it is allowed stand in order that the matters in suspenn may settle to the bottom. The clear ter is drawn off and passed on to filters, ich as a rule are constructed of layers of id and gravel formed into beds varying thickness from 2ft. 9ins. to 8ft. The arser gravel is placed at the bottom, and finest sand constitutes the surface. The iter drawn from the River Lee is similarly ated.

When the Thames is in flood and its waters turbid, it becomes desirable to close the akes, but the length of time during which is is possible clearly depends upon the rate which water is being consumed and the pacity of the reservoirs. Too often it is t found practicable to keep the intakes m the river closed as long as could be shed, and the quality of the water supplied ffers accordingly. Moreover, in times of ere frost the action of the filters is intered with by ice. It will be seen, therefore, at the purity of the water is not uniform.

Sand Filter Beds.

The tests usually applied to water to ascerin its purity are either chemical or bacteriogical. All water contains bacteria, and as rule by far the largest proportion of them harmless, but the purer water is rendered filtration the fewer are the bacteria found it. In the process of purification more than per cent. of the bacteria of the Thames ater are eliminated. Some of them are rried down in the subsidence reservoirs ith the particles of mineral matters in susnsion as these settle, but by far the larger mber are strained out by the sand filters. hen a sand filter has been at work for some tle time it is found that the top layer comes covered with a slimy film of living getable matter, and it has been proved at it is this film which is most effectual in iminating bacteria from the water. As the m grows in thickness it offers increasing struction not only to the microbes but so to the water itself until the rate of tration becomes altogether too slow. It then necessary to scrape this film off, and ith it a thin layer of the sand on which it sts.

With good sand filtration it is generally ssible to reduce the number of bacteria in ater to about 100 per cubic centimetre,† hich is very commonly taken as the standard purity from a bacteriological point of ew. This, however, is a perfectly arbitrary andard, and if any considerable percentage the 100 bacteria per cubic centimetre hapned to be of the kind that produce, say, phoid fever, they would be capable of using a most serious epidemic.

Wells.

Several of the companies supplement their supply of water from wells, and, as a rule, the water being so much purer than that from the river, it is not found necessary to pass it through subsidence reservoirs.

The Kent Water Co. derives its supply wholly from wells, and this supply, which is the purest public supply in London, is not even subjected to filtration.

When water is obtained from wells in London, these wells must be carried down through the bed of clay which underlies the metropolis into the chalk formation, as the water which in places is met with in large quantities at a few feet below the surface is quite unfit for drinking or cooking purposes. The bed of clay which has to be penetrated in well-sinking is of an average thickness of about 400ft., but when it is once pierced the water rises from the chalk to within about 80ft. of high-water mark at London Bridge.

Some of the London hospitals, such as Guy's and St. George's, have their own wells, and I cannot help thinking that it would be a wise policy on the part of other hospitals to follow their example, as the cost of pumping is not great, and where steam boilers of sufficient power are already provided the initial expense of the installation is reduced.

Raising Water by Compressed Air.

The most modern method of raising water is by the use of compressed air. A small pipe, say 1in. or 1½ins. in diameter, is passed down the bore pipe to the well below the surface of the water, and through this air under pressure is forced. It might have been supposed that the air would merely bubble up through the water, but as a matter of fact, when properly arranged, it lifts the water with it as it rises so that the bore pipe is filled with a continuous stream of water mingled with air which passes into the storage tanks.

This system possesses the advantage that there is no necessity for a pump in the borehole, some hundreds of feet below the surface, which has to be drawn up from time to time for repairs, and it possesses the further advantage that much more water can be obtained in this way from a bore pipe in a given time than by any other means.

Cisterns.

Having now glanced at the sources whence our supply is obtained and the measures which are adopted for rendering it wholesome, let us consider how we are to deal with it when it is delivered at the hospital.

Since all water companies occasionally shut off the water for repairs to their mains, it is necessary for a hospital, unless it is prepared to run the risk of finding itself temporarily without water, to provide cisterns of adequate capacity for emergencies of this kind. To be obliged in a severe winter to draw the fires of the boilers upon which you depend, not only for your supply of hot water and your steam for cooking but also for much of the warming of the building, and possibly, too, for the supply of electricity for lighting, is not a pleasant prospect, and therefore more or less storage of water upon the premises is a necessity.

An Automatic Alarm

to call the attention of some responsible person directly the water is shut off is desirable, especially where the cistern storage is small. At the Hospital for Sick Children we have experienced the value of this piece of apparatus, which is fixed in the boiler-room.

As to the quantity to be stored, it will probably be found sufficient if provision is made for one full day's supply, but it is better to err on the safe side, especially when possible extensions of the hospital buildings are considered. I am afraid, however, that there are very few hospitals in London which have storage capacity for this amount.

Requirements of Storage Cisterns.

Wherever it is possible the storage cisterns in a hospital should comply with the following conditions:—

(1) They should be two in number and should be placed at a sufficient height to command the whole hospital.

(2) They should be of equal size and so arranged that each of them supplies approximately one-half of the hospital.

(3) They should be so arranged that when it is necessary for either of them to be cleaned out the other one will supply the whole hospital temporarily.

(4) They should consist of closed tanks so that all dirt, as well as birds, mice, &c., may be excluded.

Every storage cistern over and above the two which are indispensable involves extra labour for cleaning and additional valves to be kept in repair.

Defects of Small Cisterns Connected.

It is a very common but unsatisfactory arrangement to fix two small cisterns instead of one large one and connect them together on the same level so as to form a single cistern in two sections. Where this is done the cistern which has no ball valve almost invariably gets covered with scum on account of the want of proper circulation of the water, and this scum in certain cases, when allowed to accumulate, becomes exceedingly foul. Where it is absolutely necessary to use two cisterns in this sort of way, one of them should be placed above the level of the other, so that all the water passes first into the upper cistern and from it into the lower one, the supply pipes to the building being taken off the latter.

The companies under their Acts of Parliament are not bound to supply water to an unlimited height, and therefore in some cases it may be found that the pressure in the mains is insufficient to charge cisterns which are situated at the top of the building. Where this is the case it becomes necessary for the hospital to pump.

My experience confirms what might have been inferred from the rapid increase of the population of London, that the pressure in the companies' mains has in some places, at any rate, somewhat diminished during the last few years, so that storage which used to be sufficient has had to be increased.

Supply of Water to Operating Theatre.

Although the supply of water as delivered by the companies is suitable for most hospital purposes, it is frequently considered desirable that the supply to the operating theatre should be perfectly free from bacteria, and this can be accomplished in three ways—either the supply of water may be passed through a filter the pores of which are too small to permit the microbes to traverse them, or the water may be raised to a sufficiently high temperature to destroy the bacteria, or the bacteria may be destroyed by impregnating the water with ozone—a method recently introduced on the Continent. The first method is the one most generally favoured, and the kind of filter usually adopted for the purpose is the Berkefeld. The filtering material of the Berkefeld filter is a fossiliferous earth of great porosity which is moulded into the form of a hollow cylinder. One or more of these cylinders or candles, as they are frequently termed, are enclosed in a metal case to which the water to be filtered is admitted through a pipe. The cylinders are closed at one end whilst the other is fitted with a metal cap having a nozzle that projects watertight through the external case. In addition to periodical cleaning, which is done with a piece of loofa, the cylinders should be boiled for an hour every other day if they are to be kept really germ-proof.

A combination of a small steam heater and filter has quite recently been introduced with the object of providing a constant stream of sterile water of any desired temperature in the operating theatre.

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* A paper read before the Hospital Officers' Assoation.

† A cubic centimetre is equal to about a quarter of a aspoonful.

Drainage.

It is needless for anyone nowadays to insist upon the duty of maintaining the drainage arrangements of a hospital in a satisfactory state, for this is recognized on all hands, but I take it that what the board of management of a hospital want to know is:—

(1) Can drains be constructed in such a way as not to readily become defective, as they too often do?

(2) Can we periodically assure ourselves that our drains continue to be in good order?

Well, I know some drains that have been in constant use since the year 1876 which to-day are quite sound, and I know others that were laid in 1884 to which the same remark applies; the former are at one of the large public schools and the latter at the Hospital for Sick Children. In each case practically every other section of the drainage system of which they formed a part has become faulty, and the greater portion has had to be renewed.

The drains which have survived are constructed of cast-iron and the drains which have perished were of glazed ware, and, though I am bound to add that at the hospital we have one length of old iron drain which is not quite sound, yet to my mind this evidence is so thoroughly convincing that I have no hesitation in insisting upon cast-iron drainage wherever durability is required.

I now come to the second question, namely, whether it is possible from time to time to make sure that the drains of a hospital are sound. Certainly this is possible, but only if your drainage system has been so designed that it is practicable to apply positive tests.

Positive and Negative Tests.

To test the drains of a hospital when it is empty is one thing; to test these same drains when the hospital is in full work is altogether a different matter.

In the great majority of cases, unless a drain is hopelessly bad, it is quite possible by a judicious selection and application of the test to obtain any result you may desire. That is to say, if you apply what I term a positive test, such as the water test or the air test, and apply it properly, you will prove a faulty drain to be faulty, but if you apply a chemical test or a smoke test you may fail to detect the leak and therefore imagine that the drain is sound when it is not. These latter tests I term negative tests, because the evidence they afford of the soundness of a drain can only be of a negative character.

Unreliability of any but Positive Tests.

A glaring instance of the dangers incurred by placing reliance on any but positive tests came under my notice a few years ago. I was instructed by a prospective tenant to report upon the sanitary arrangements of a London house. A day or two before I made my survey the landlord asked the chief sanitary inspector for the district to examine the house, and he gave a written certificate on the official paper of his vestry in the following words: "In answer to your letter of the 2nd inst., I have to inform you that I visited the above premises and found the sanitary arrangements in good working order." My survey revealed the fact that not merely the house drains but also the public sewer itself were ventilating inside the building, and I had to condemn the house as dangerous to health. It turned out that the inspector, to use the words of the medical officer of health, "having applied the chemical test and not getting any result believed the sanitary arrangements to be in good working order."

I do not think I need say a word more to show that a test which does not give a positive ascertainable result is of no real value, and if relied upon may be very misleading.

Conducting Tests without interfering with working of Hospital.

Now what has all this to do with the question as to whether it is possible at any time to ascertain the truth as to the condition of hospital drains? If a negative test is not to be depended upon, it may be asked why not apply a positive one and settle the matter? I can answer this best by repeating what I was told at one of the large London hospitals only a few weeks ago, and this was that though they were so particular as to have the drains regularly tested every quarter, yet the water test was not used for the simple reason that *in order to apply it, it would have been necessary to stop the working of the hospital.*

The whole sewage of this hospital is discharged through a single main drain, and since it is essential for a drain or other pipe to be thrown out of use during the time that it is being subjected to any positive test, the application of such a test in the daytime would have been impracticable. That is why I have said that the possibility of being assured periodically that the drainage is sound must depend upon the way in which the system of drains is laid out, and you will see at once that for testing purposes it is necessary, in the case of a large hospital, to have several outfall drains to the sewer.

Expansion of Clay.

I now want to draw your attention to certain points which materially affect the durability of drains. One point of great importance, which nevertheless so far as I know has never yet received proper consideration, is the expansion and contraction of the soil in which the drains are laid. The great force exerted by the expansion of clay may perhaps be realized from a consideration of a case which was brought under my notice a few years ago by an eminent architect who was called in to report upon a church the chancel of which was separating from the nave. His idea at first was that the weight of the nave, which was the heavier part of the structure, had caused it to settle, but examination showed that it was the chancel which had sunk. The cracks in the walls were watched, and after a time it was found that the chancel had risen again. The cause of this curious action proved to be solely the fact that in getting out the foundations the excavations for the nave had been carried down deeper than for the chancel by about 18ins., and sufficient power was exerted by the expansion of this 18in. layer of clay to lift the whole chancel bodily.

Now drains as a rule are near the surface at their upper end and considerably deeper at their lower end, especially when they are laid of considerable length, and if they are laid in a clay soil it will be seen that they must be exposed to severe strains when the clay expands, this expansion taking place to a greater extent near the surface, where it more readily become dry and moist according to the weather, than at a depth of 5ft., 6ft. or more from the surface. This difficulty may be overcome by excavating your drain trench to a uniform depth and filling it in with concrete, the upper surface of which is given a slope corresponding to that required by the drain. Where this is done the thickness of the clay below the drain is everywhere kept equal, and moreover the pipes are given a very strong foundation. In a good many parts of London the surface is sand or gravel, and it is a matter of common experience that the drains in such a soil stand very much better than those laid in clay.

Frost.

The expansion of clay soil may be caused, however, not only by moisture but by severe frost, and in a hard winter we had some years ago I was very much struck with the number of paving stones recently laid which were lifted out of position, and in man cases broken right across. This action I a inclined to think takes place in soil whic is not of a heavy clay character, for met with an instance where a drain whic was laid just below the surface of a lawn Farnham Castle was cracked in two exactl where it entered one of the massive wall Here there could have been no question the fracture being caused by settlement of th building, and it must, in my opinion, hav been due to the expansion of damp soil in hard frost.

Injury to Drains by Settlement.

The settlement which always occurs mo or less in a new building is a common cau of injury to drains, but now that the Lond County Council have in their new by-law provided that all drains passing throug walls must be left free, it is to be hoped tha some improvement in this respect will, London at any rate, be effected.

Joints.

A third cause of injury to undergroun drains is the quality of the cement used making the joints. Portland cement as comes from the manufacturers is as a rule to "hot" for use, and if employed before it ha properly cooled down the subsequent expan sion which occurs will fracture the pipe I have known of at least three cases wher after the drains had been tested and covere up, the socket of each pipe has been burst in this way. This shows the necessity insisting upon drains being tested by th builder some months after he has finished th work, and of holding him responsible f them until they have stood this final test.

Iron drains are jointed with molten lea and not with Portland cement, and th danger I have spoken about refers exclusive to glazed-ware drains.

Damage to Drains by Steam and Hot Water.

The fourth cause is the turning of steam large bodies of hot water into the drain which has a good deal to do with the rap deterioration of stoneware pipes.

The fifth common cause of injury to drai to which I shall refer is that occasioned by th being tampered with in an unauthorized wa Steam fitters are great offenders in this respe An order is given for, say, a steam hot pla or some other apparatus heated by steam, a probably it is not thought for a moment th there is any necessity for considering t safety of the drains when so doing. Ho ever, the fitter requires some means of getti rid of the condensed steam from the hot pla and without saying a word to anyone knocks a hole in the nearest drain. Seve cases of this kind have come under notice.

Of course this sort of thing ought to impossible in any hospital which has works department, for then either the fitti would be entirely executed by the depa ment or else it would be carried out un the eye of the clerk of works.

Maintaining the Drainage System.

I now come to the question of maintain the drainage system in proper order.

As to design, there are five points whic consider practically axiomatic, but they ha not so far been deemed by the Lon County Council of sufficient importance any by-law to be made concerning th These are :—

(1) That the drains should be as small possible, because small drains are more rea made self-cleansing than large ones.

(2) That branch drains should be kep short as possible, so as to provide as li storage capacity as may be for foul air.

(3) That drains should have as few trap openings as possible, because the smaller number of gulleys the greater the quantit liquid which each of them will have to ta and consequently the better they will flushed.

(4) That no trapped gulley in direct comunication with the drain should receive erely rainwater or surface water, because dry weather, owing to the partial evaporaon of its contents, a rainwater gulley will rovide an outlet for any foul air which may xist in the drain to which it is connected.

(5) That iron drains, where they pass rough manholes, should be provided with on inspection chambers fitted with airtight overs.

Even where the drains are laid in cast-iron is very common for these airtight inspection hambers to be omitted, and as a conseuence the brick manhole, instead of being erely an access chamber to the drain, beomes an expansion of the drain itself, which filled with air of as foul a character as hat which may happen to be in the pipes.

Outlets from Baths.

In order that the drain may be as selfleansing as possible it is most desirable that baths should be fitted with large outlets nd arranged so that the waste water from hem may flush as great a length of underround pipe as possible. I have found it ery advantageous also to collect waste water rom any hydraulic lifts into an automatic ush tank at the head of the drain, so that his water, instead of flowing away by riblets, may be collected and discharged in ulk for flushing purposes.

Flushing and Inspection.

It is commonly supposed that if drains are o be kept in thorough order they should be egularly flushed out every three months or ven oftener and the manholes opened and leaned, but a drainage system must have een constructed very badly indeed if all this ttention is requisite, and I think it must be bvious that to have all the manholes, and articularly any that may be inside the uilding, opened quarterly is very unwise where it can be avoided, as such a proceeding ffords the opportunity for foul air to be isseminated within the hospital.

Drains from Kitchen and Scullery.

The only drain where there need be any anger at all in maintaining cleanliness is he one from the kitchens and scullery, and ere an automatic flush tank should always e provided instead of the old-fashioned nsanitary grease trap. I believe that if an utomatic tank were charged with hot water o difficulty would be found on the score f grease, but I have not yet tried the xperiment.

Most London hospitals, I believe, have the rains periodically tested, and where the rains are of iron, and are fitted with iron nspection chambers, the tests can be carried ut without the necessity of opening more han a small proportion of the manholes.

In order to permanently secure sound work t is most necessary that stringent tests should e applied during construction, and that the aterials used should be of the best quality.

L.C.C. By-laws.

The London County Council has issued y-laws to which all new sanitary work within the county of London must conform, nd the well-nigh universal opinion is that hese by-laws embody an ideal of perfection eyond which it would be folly to attempt o go, whereas the real fact is that they are ntended to represent not the maximum but he *minimum* requirements of sanitary science. This ought to be evident from the circumtance that they are enforced not only in he houses of the wealthy but equally in he humblest dwellings of the poor, and ospitals, therefore, should on no account eel that in sanitary arrangements they are up to date merely because they are not ummoned for a breach of the by-laws.

Pipes above Ground.

It is rather curious that whilst, as I have xplained, so much misdirected energy is xpended upon cleansing underground drains, no care seems ever to be bestowed upon the pipes which are above ground and which must, many of them, of necessity get much more foul than the drains themselves.

Here I consider that periodically a plunger should be drawn through such pipes from the top to the bottom to cleanse them of their impurity, whilst disinfectants may also be used with advantage during the operation.

Vent Pipes.

Drain ventilating pipes may be thought to be strange places for birds to choose in which to build their nests, but when they get the chance they often make use of them in this way. Both in London and in the country it is well therefore that the upper open ends of such pipes should be provided with a wire cage to prevent them being blocked.

Iron ventilating pipes, unless galvanized or otherwise protected against corrosion, frequently become choked with rust. The interior of the pipe being constantly exposed to moist air, becomes oxidized, and the rust falls in powder, collects where there is a bend, and renders the pipe useless for ventilating purposes. Care must be taken that where ventilating pipes terminate at the roof they should not do so too close to the chimney pots, or in the event of down-draught through one of the chimneys foul air may be drawn into the building.

Anti-syphon Pipes.

It is usually impossible to apply any really satisfactory test to the pipes which are known as anti-syphon pipes. In most cases they form a loop on the main soil or waste pipe, and then nothing short of cutting them at both ends and drawing a plunger through will prove they are free from obstruction.

During recent years very great improvements both in design, construction and arrangement of sanitary appliances have been introduced, and without going into details I propose briefly to indicate points which ought to receive attention.

Building into Walls.

One great object to be aimed at is to have everything as simple as possible, and also thoroughly open to view, so that dirt, which generally requires to be seen before it is removed, may be deprived of hidden lurking places.

As far as may be, every sanitary appliance should be built into the wall, and where this is not practicable it should be supported on light steel bearers projecting from the wall as brackets, or, in the case of baths, supported upon plain cylindrical feet at least 6ins. high. It facilitates cleanliness if all surfaces are white and if they are thoroughly well glazed.

In former times every sink had a wooden cupboard below it, but such cupboards should not be tolerated anywhere as they are almost invariably made receptacles for damp cloths and odds and ends which it is desired to put out of sight.

Fixing Sinks and Lavatory Basins.

At the present time there is a great fashion for fixing sinks and lavatory basins a few inches away from the wall, there being a prevalent idea that this arrangement favours cleanliness, whereas, as a matter of fact, it provides two extra surfaces to be cleaned, namely, the wall behind the appliance and the back of the appliance itself, and it provides these two surfaces where they are screened from observation. By building a sink into the wall and keeping the face of the wall flush with the inside, these two unnecessary surfaces are abolished.

Overflows.

The question of overflows is a difficult one. Most overflows are wholly uncleanable, and are liable to become very foul and offensive. Where they are cleanable it is difficult to get them attended to properly. On this account my practice now is to dispense with overflows wherever possible; this can always be done where the floor of the apartment is of terrazzo or other impervious material.

Floor Channels.

It simplifies matters very much if sinks, baths and lavatory basins are made to discharge into a channel in the floor, because then it is possible to dispense with traps and anti-syphon pipes, and to arrange the waste pipes so that they can be thoroughly cleaned. Where this method is adopted the channels as far as possible should be open and should have a good fall to a trapped outlet close to the external wall.

I noticed in a recently constructed operating theatre, where a system of floor channels is adopted, that the channels were raised above the floor level, presumably with the idea of preventing splashing from the waste pipes which discharge into it, but I prefer to sink a channel below the floor level and to give the floor of the apartment a fall in this direction so that it may be readily swilled down. Splashing can easily be avoided if the waste pipes are connected to branches on the channel.

Where it is necessary to cover a floor channel the gratings should be of a very much more open pattern than is usually met with to allow the condition of the channel itself to be seen at a glance.

Baths.

A good deal of water, and hot water too, is wasted where baths with parallel sides are fitted instead of taper baths: the difference in capacity of two 5ft. 6ins. baths being about 6 gallons when holding water 9ins. in depth, and about 12 gallons when filled.

The recent improvements in enamelling iron lead me to hope that before long we shall be able to have all our sanitary appliances constructed of this material rather than of earthenware, the durability of which, especially when white enamelled, leaves much to be desired.

Steam Plant.

It is a practical necessity for a modern hospital of any size to be provided with steam boilers, if only for cooking purposes; but nowadays steam is largely used for heating buildings as well as for disinfecting and sterilizing, and where hospitals have their own wells or electric-lighting plant further uses are found for it.

Boilers.

There are three types of steam boilers which are well suited for hospital purposes. These are the Lancashire boiler, the marine type cylindrical boiler, and the water-tube boiler, and it will depend very largely upon circumstances which is the best to adopt. Where there is ample space and facilities for getting them into position, Lancashire boilers will be as suitable as any; where floor space has to be economized the marine type may with advantage be adopted; and where the position is awkward and cramped, and the boiler cannot well be put in in one piece, it may be advisable to adopt the water-tube form. Whichever type is adopted it is necessary to put in at least two boilers, so that whilst one is being cleaned out or repaired the other may be available for use.

In order that the boilers may work economically it is necessary to get as much heat out of the coal as is possible, and with this object not only is the direct heat of the burning fuel utilized, but the hot gases before they are carried into the chimney shaft are made to pass over as large a surface of the boiler as circumstances permit.

Economizers.

A certain amount of heat must be expended in creating a sufficient draught in the chimney to carry off the products of combustion, but unless special means are taken to prevent it a great deal more heat is carried off through the chimney than is necessary for this purpose and is wasted. It is therefore advisable to adopt a piece of apparatus which is known as an economizer. This consists of a number of pipes arranged vertically side by side in a brick chamber through which all the flue gases are made to pass as they escape to the chimney, and the feed water, in traversing the economizer pipes on its way to the boiler, is heated by these gases.

The exterior of the pipes is kept clean by means of scrapers which pass slowly and regularly up and down, and are worked mechanically either by a small steam engine or else by an electric motor.

Long before it becomes necessary to renew a boiler more or less deterioration takes place, and it is therefore well worth while to instal boilers in the first instance which are of greater strength than is actually required for immediate purposes. This will allow deterioration to go on for a much longer period than if the boilers when new are just suited to the steam pressure employed.

Condensed Steam and Incrustation.

The steam arrangements of a hospital should be so laid out that as far as possible every drop of condensed steam is returned to the boilers, and this for two reasons. In the first place it is extravagant to allow hot condensed steam to run away into the drains, because its place in the boilers will have to be taken with water which will have to be heated; and, secondly, condensed steam is the most suitable liquid with which to feed a boiler. This is particularly the case in London, where the water is hard and tends to form a deposit on the interior of the boiler. The deposit is a very bad conductor, and therefore even a thin scale seriously interferes with the transference of heat from the burning fuel and the hot flue gases to the water which is being boiled. In order to prevent this boiler incrustation a very good plan, and one very commonly adopted, is to pass all the feed water through a heater, which consists of a metal chamber in which is a coil or other arrangement of steam pipes. The steam in the pipes heats up the water in the chamber and causes it to deposit the bulk of those substances which constitute scale before it passes on to the boilers. Where a steam engine is employed the exhaust steam can be utilized for heating the feed water in this way. The feed water is usually returned to the boiler by means of a pump, but it is sometimes forgotten that a pump for hot water must have no suction pipe, that is to say, the pump must be placed below the level of the tank which contains the water which is to be forced into the boiler, or it will not work satisfactorily.

Not long ago I was being shown the general arrangement of the steam plant at one of the large London hospitals, and I found that the pipes which conveyed condensed steam were many of them carried outside the building, and that they were not covered with any non-conducting material to prevent any undue loss of heat. I enquired the reason and was informed that, even with these bare pipes, the condensed steam arrived at the feed pump at times so hot that it was necessary to add cold water, and this waste of heat and waste of coal was going on simply because the feed pumps were placed above the tank into which the condensed steam flowed.

Mechanical Stokers.

To ensure uniformity in stoking and to save labour, mechanical stokers are often fitted to boilers, but it is questionable how far their employment in hospitals is an advantage.

Electrical Plant.

Very few hospitals as yet have their own electrical plant, and the great majority therefore are compelled to take their current from a supply company.

So far as the lighting of a hospital by ordinary electric glow lamps is concerned, the alternating supply is as good as a continuous supply, but for motors the latter is more satisfactory.

Voltage of Lamps.

The legal unit of electricity in this country is known as the Board of Trade unit, and the number of units supplied to a consumer is registered by a meter with a dial similar to that of a gas meter, but it is most important to clearly grasp the fact that, whereas gas is charged for merely according to the volume that is used, a unit of electricity is based not only upon the quantity but also upon the pressure at which that quantity is supplied. With a pressure of 100 volts a 16 candle-power lamp takes twice as much current as a similar lamp at a pressure of 200 volts, and only half as much current as one at 50 volts. What is paid for is electrical *energy*, and to estimate this you must multiply the current by the pressure. The Board of Trade unit is 1,000 watts or 1⅓ horse-power in operation for one hour, and that energy is enough to keep a 16 candle-power lamp glowing for about 16 hours.

Systems of Charging for Current.

There are two general systems of charging for electricity—the flat rate system and the maximum demand rate system. A flat rate system is one under which the charge for all electricity used for lighting is uniform, and the charge for all electricity used for motors or for heating is also uniform.

Under the maximum demand rate system part of the electricity used for lighting is charged for at one rate, and the rest at a different rate, and the same distinction is made in the charge for electricity for motors and heating. In the latter case it is found that to a very great extent the current taken is distributed over a considerable number of hours, and therefore supply companies do what they can, by reducing their charges, to encourage the use of electricity for such purposes.

That the maximum demand system of charging is favourable to the companies is shown by the fact that it has been adopted by over 160 electrical supply undertakings in the United Kingdom. Whether the introduction of the system would be to the interest of hospitals I cannot say, but any hospital could fix an indicator * for itself and determine the question.

Wiring.

Now with regard to the wiring of a hospital. If current is obtained from a supply company it will be necessary to keep the mains for lighting and power purposes separate and distinct, with a meter upon each, if the benefit of the reduced rate for current for motors, fans, X-ray apparatus and so forth is to be obtained.

Although failures in the supply of electricity from a central station are not of frequent occurrence, it is an advantage where possible to take current regularly from two companies, or else to take the whole current from one company and to have what is known as a "stand-by" from a second. In either case, with a suitable arrangement of switches, should one supply fail there is the other to fall back upon at a moment's notice.

Main Branches.

In laying out the wiring system of a hospital care should be taken to protect all main branches from injury in the event of an outbreak of fire, for it must be remembered that the insulation of electric cables consists of inflammable material, such as india-rubber, which renders them much more liable to damage than gas pipes. They should, in my opinion, be carried in some form of conduit laid underground or built into solid brick walls.

Small Branch Circuits.

The small branch circuits may preferably be run in steel tubes with screwed joints, care being taken to keep the tubes amply large enough to allow the conductors to be drawn out and replaced, should this become necessary. With this precaution the tubes may with safety be buried in the walls. In the open air or in cellars the tubes should be lined internally with insulating material to prevent condensation of moisture, which when present invariably after a time destroys the covering of the wires. Conductors should be kept away as much as possible from pipes conveying water or steam, and this is more particularly necessary where the wiring is run in wood casing. Wood casing may by chemical treatment be rendered non-flammable.

The rapid extension of the use of electricity in one way or another for curative purposes makes it most desirable that in wiring a hospital a very large margin should be allowed in the sizes of the conductors. I am confident that where no provision except for lighting has been made it will in a few years become necessary to replace much of the wiring with conductors of larger size.

Ward Lighting.

For ward lighting the best plan, in my opinion, is to adopt single pendant lights down the centre, supplemented by brackets along the walls. The brackets may be placed one between every two beds, and may either be fixtures or else of a semi-portable type attached to the wall with a hook and provided with a flexible cord taking current from a wall-socket. Since, in any case, wall-sockets for hand-lamps are practically a necessity, the latter system is rather the cheaper to instal, but the number of flexible cords it involves is a decidedly weak feature, for they will not bear rough usage.

Lights over Operating Table.

It is a good plan to wire the lamps over the operating table of a theatre on two circuits, so that the melting of the safety-fuze on one of them will not extinguish all the lights. As a precaution, some second means of illumination should also be provided, or one day the failure of the light during a critical operation may result in the loss of a patient's life.

Checking Current Consumption.

The question of checking and controlling the consumption of current is an important but somewhat difficult one. I consider that a good deal may be done to effect economy by making each ward a unit and providing it with its own meter, and in this way fostering the natural spirit of emulation which exists between the various wards.

Switches.

Economy is, I am sure, promoted by th free use of two-way switches, which allo the lights in rooms or corridors which hav two doors to be extinguished at either o them. Another useful application of thi switch is that which allows either of tw lamps to be lighted but prevents their bot being in use at the same time.

In the ward bathrooms switches of th ordinary kind may be adopted, but in al other bathrooms and lavatories it is desirabl that the switch for turning on the ligh should be worked by the means of a bol fitted on the inside of the door, so that th light cannot be left on when the bathroom unoccupied.

Cellars which are ordinarily kept locke may be arranged with an automatic swit which puts on the light when the door opened and puts it out as soon as the door closed.

Finsen Light and X-Rays.

Passing on now from the subject of illum nation to that of medical applications electricity, such as the Finsen light ar X-rays, neither alternating current nor a hig

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* Consisting of a gauge tube and a thermometer with a strip of foil fixed around the bulb and forming part of the electrical circuit.

ressure direct current is suitable, and it is ecessary to transform or rectify the former nd to reduce the voltage of the latter.

The requisite alteration of current can be erformed by an electric motor coupled to a ynamo. The motor is driven by the current urnished by the company and in turn drives he dynamo, which is so designed as to urnish direct current at the proper pressure.

Another way of reducing the pressure is y inserting a resistance in the circuit to issipate the surplus energy, but this is a asteful method and should not be adopted here much current is used. At one of the ondon hospitals I recently saw a single insen lamp worked in this way off a 200-olt circuit. The lamp was in regular peration, I understood, for eight or more ours a day, and it was taking about 13 mperes. The cost of running this lamp, ith electricity at 2d. per unit, if used six ays a week would be £54 per annum for urrent, and of this sum no less than £40 ould be wasted in the resistance and only 14 usefully employed in the lamp itself.

In this case great economy could be effected y using two lamps and passing the current rst through one and then through the other. this way the second lamp would take the lace of part of the resistance, and since no ore current would be wanted for the two mps than for one, and two lamps would nly have to be worked half the time of one, e electricity bill would be reduced, for insen work only, by £27 per annum. If the umber of lamps were increased to three the cost of electricity would be further reduced from £54 to £14.

Thermometers.

The only other use of electricity to which I have time to refer to is that of indicating and recording temperature by means of platinum thermometers. The thermometers may be distributed over the hospital and placed, for example—

(*a*) In the boiler-room to show the temperature and therefore the pressure of the steam, and the temperature of the feed water.

(*b*) In the chimney shaft to show the temperature of the flue gases.

(*c*) In the hot-water pipes.

(*d*) In the wards.

(*e*) In the air-ducts where the plenum system of ventilating is in use.

(*f*) In the refrigerators.

It is not necessary to be near the thermometer in order to read it. Wires are brought from the various thermometers to some convenient spot and connected to terminals on a board to which the indicator can be attached and read in a few seconds, or if desired the thermometers can be made to record their readings automatically on charts.

It may be that some day an instrument of this kind will be found in every hospital for accurately recording the variations in temperature of patients, and already it has been employed, I understand, by Major Ross for this purpose in his investigations of malarial fever.

Current Market Prices.

FORAGE.		£	s.	d.	£	s.	d.
Beans	per qr.	1	14	0	2	0	0
Clover, best	per load	3	15	0	4	2	6
Hay, good	do.	3	10	0	3	15	0
Sainfoin mixture ...	do.	3	10	0	3	17	6
Straw	do.	1	12	0	2	0	0

OILS AND PAINTS.

Castor Oil, French ...	per cwt.	1	0	5		—	
Colza Oil, English ...	do.	1	1	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0		—	
Linseed Oil, barrels ...	per cwt.	0	14	10½		—	
Petroleum, American ...	per gal.	0	0	5⅜		—	
Do. Russian ...	do.	0	0	4¾		—	
Pitch	per barrel	0	8	0		—	
Shellac, orange	per cwt.	7	5	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	5	3		—	
Tar, Stockholm	per barrel	1	3	6		—	
Turpentine	per cwt.	1	18	9		—	

METALS.

Copper, sheet, strong ...	per ton	80	0	0		—	
Iron, Staffs., bar ...	do.	6	0	0	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	10	0	10	15	0
Lead, pig, Soft Foreign...	do.	13	0	0		—	
Do. do. English common brands	do.	13	5	0	13	7	6
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14	0	0		—	
Do. pipe	do.	15	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	5	0		—	
Do. floor brads... ...	do.	9	0	0		—	
Steel, Staffs., Girders and Angles	do.	5	10	0	6	0	0
Do. do. Mild bars ...	do.	6	0	0	6	5	0
Tin, Foreign	do.	131	2	6	131	12	6
Do. English ingots ...	do.	132	0	0	133	0	0
Zinc, sheets, Silesian ...	do.	28	0	0		—	
Do. do. Vielle Montaigne	do.	29	0	0		—	
Do. Spelter	do.	25	2	6	25	7	6

TIMBER.

Soft Woods.

Whitewood, American, logs...	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	1	6
Fir, Dantzic and Memel	per load	2	7	6	4	15	0
Pine, Quebec, Yellow ...	do.	4	0	0	7	0	0
Do. Pitch, American...	do.	2	10	0	6	0	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, St. Petersburg, White, 1st, 3×11	per std.	9	5	0		—	
Do. do. do. 2nd, 3×11	do.	9	0	0		—	
Do. do. Yellow, 1st, 3×10	do.	9	10	0		—	
Do. do. do. do. 3×9	do.	14	15	0		—	
Do. do. do. do. 2½×7	do.	10	10	0		—	
Do. do. do. 2nd 3×9	do.	9	5	0		—	
Do. do. do. 3rd, 3×9	do.	8	10	0		—	
Do. Archangel, White, 2nd, 3×11	do.	11	0	0		—	
Do. Nederkalix Yellow, 1st, 3×8	do.	10	15	0		—	
Do. Soderhamn, Yell., 4th, 3×9	do.	9	10	0		—	
Do. Montreal, Yellow Pine, 1st, 3×11	do.	17	10	0	23	0	0
Do. do. do. 3rd, 3×11	do.	12	10	0		—	
Do. Quebec, Red Pine, Unsorted, 3×9	do.	8	0	0		—	
Do. West Bay Spruce, 1st, 2nd & 3rd, Unsorted ... 4×6	do.	6	10	0		—	
Do. Amhurst Spruce, Unsorted, 3×9	do.	8	0	0		—	
Do. do. do. do. 3×7	do.	7	0	0		—	
Battens, all kinds ...	do.	5	15	0	9	10	0
Flooring Boards 1in. prepared, 1st... ...	per square	0	9	0	0	11	9
Do. 2nd	do.	0	9	0	0	10	6
Do. 3rd, &c.	do.	0	6	0	0	9	6

Hard Woods.

Ash, Quebec	per load	4	10	0	7	15	0
Birch, New Brunswick...	do.	2	15	0	6	0	0
Box, Turkey	per ton	8	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	3½		—	
Do. Honduras ...	do.	0	0	$5\frac{7}{32}$		—	
Do. Tobasco	do.	0	0	4¼		—	
Elm, Quebec	per load	4	5	0	8	15	0
Mahogany, Average Price for Cargo, Honduras...	per ft. sup.	0	0	4⅝		—	
Do. African ...	do.	0	0	$3\frac{1}{16}$		—	
Do. St. Domingo	do.	0	0	4		—	
Do. Cuba ...	do.	0	0	6¼		—	
Do. Lagos ...	do.	0	0	4⅛		—	
Do. Benin ...	do.	0	0	$2\frac{21}{32}$		—	
Do. Tobasco ...	do.	0	0	4¾		—	
Oak, Wainscot	per log.	2	5	0	5	15	0
Do. American quartered, planks and boards	per ft. cu.	0	2	6	0	5	0
Do Dantzic & Stettin	per load	3	0	0	6	10	0
Do. Quebec	do.	5	0	0	8	0	0
Teak, Rangoon, planks...	do.	8	0	0	15	10	0
Do. Indian logs ...	do.	10	0	0	18	10	0
Do. Indian planks ...	do.	13	0	0	20	0	0
Do. Moulmein logs ...	do.	6	10	0	8	0	0
Kaurie pine logs	per ft. cu.	0	1	6	0	2	0
Do. do. planks ...	do.	0	3	0	0	3	6

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Jan. 19	Manchester—Foundations...	Gas Committee	C. Nickson, Gas Department, Town Hall, Manchester.
,, 19	Billericay—Conversion of Town Hall into Police Station...	Joint Committee	F. Whitmore, Duke Street, Chelmsford.
,, 19	East Ham—Enlargement of Schools	Education Committee	R. L. Curtis, 11 and 12 Finsbury Square, E.C.
,, 19	Miskin—Church	——	E. M. B. Vaughan, Architect, Cardiff.
,, 20	Kidderminster—Engine-house, &c.	Corporation...	Wilcox & Raikes, Union Chambers, 63 Temple Row, Birmingham.
,, 20	Rotherham—Post-office	Commissioners	H.M. Office of Works, Storey's Gate, S.W.
,, 21	Plymouth—Removal of Partition	Education Authority	E. C. Cook, Secretary, 18 Princess Square, Plymouth.
,, 21	Lutterworth—Police-court, &c. ...	County Council	S. P. Pick, 6 Millstone Lane, Leicester.
,, 21	Pendoylan, Wales—Additions to Schools	——	E. J. Williams, 17 Quay Street, Cardiff.
,, 21	Leeds—School Chapel	——	J. W. Thackray, 4 Greek Street, Leeds.
,, 23	Youghal, Ireland—Alterations to Bank...	Provincial Bank of Ireland	W. H. Hill & Son, 28 South Mall, Cork.
,, 23	Billericay—Cottage Homes	Guardians	C. E. Lewis, New Road, Brentwood.
,, 23	Crieff, N.B.—Alterations, &c., to School	School Board	M. Finlayson, Clerk to Board, Crieff.
,, 24	Arnside, near Kendal—Aisle to Church	——	R. M. Rigg, Architect, Arnside.
,, 24	Bridgwater—Additions to Fire-station ...	Town Council	Municipal Offices, High Street, Bridgwater.
,, 24	Foleshill, Coventry—Hospital	Rural District Council	T. F. Tickner, High Street Chambers, Coventry.
,, 24	Leeds—Doors, &c.	——	City Engineer's Office, Leeds.
,, 24	London, E.C.—Restoration of 17, Fleet Street, E.C.	London County Council ...	General Section, Architect's Department, 15 Pall Mall East, S.W.
,, 24	Newcastle-on-Tyne—School	Urban District Council ...	County Surveyor's Office, Moot Hall, Newcastle.
,, 25	Tideswell—Lock-up...	County Council	J. S. Story, St. Mary's Gate, Derby.
,, 25	Deri, Wales—Thirty-two Houses	No. 2 Building Club	P. V. Jones, Architect, Hengoed.
,, 25	Erdington, Birmingham—Council House, &c.	Urban District Council ...	G. Kerrick, 73 Colemore Row, Birmingham.
,, 26	London, E.—School...	London County Council...	Architect's (Education) Department, Room 148, Education Offices, Victoria Embankment, E.C.
,, 26	Rainhill—Mess-room to Asylum ...	Committee of Visitors	J. Gornall, Clerk's Office, Rainhill Asylum, Lancs.
,, 28	Holyhead—Gardener's Cottage ...	——	R. R. Williams, Stanley House, Holyhead.
,, 28	Grange, Rhos, Wales—School ...	Education Authority	W. Slater, 9 High Street, Wrexham.
,, 28	Ruthin—School	Education Authority	W. Slater, 9 High Street, Wrexham.
,, 28	Wolverton—School ...	Education Committee	C. W. Watkins, Education Offices, Aylesbury.
,, 30	Blything—Fire-escape Staircase ...	Guardians	H. A. Mullens, Union Offices, Bulcamp, Halesworth, Suffolk.
No date	Swansea—Two Cottages ...	Mr. J. R. Richards	H. A. Ellis, Fisher Street, Swansea.
,,	Skipton—Residence...	——	J. W. Broughton, 19 High Street, Skipton.
,,	Kelbrook—Extension to Shed	Mill Co., Ltd.	Proctor & Proctor, 3 Grimshaw Street, Burnley.
,,	Ripon—New Shops and Warehouse	District Industrial Society	Co-operative Wholesale Society, Ltd., Architect's Deptartment, 1 Balloon Street, Manchester.
	ENGINEERING:		
Jan. 19	Kemeys, Mon.—Bridge	County Council	County Surveyor, Newport, Mon.
,, 20	Newcastle—Heating by Hot Water	Joint Hospital Board	J. H. Morton, 50 King Street, South Shields.
,, 20	Blaenclydach, Wales—Water Mains	Rhondda U.D.C. ...	O. Thomas, Gas and Water Offices, Pentre, R.S.O., Glam.
,, 20	Bury, Lancs—Pipelaying, &c.	Joint Water Board	J. Cartwright, Peel Chambers, Bury.
,, 21	Firsby, Lincs—Removal of River Deposit	Drainage Commissioners	J. H. Johnson, Witham Office, Boston.
,, 23	Epsom—Hot-water Plant, &c.	Asylums Committee	Clerk to Committee, 6 Waterloo Place, S.W.
,, 23	London, S.E.—Footbridge, &c. ...	Camberwell Borough Council ...	Town Hall, Camberwell.
,, 24	London, N.—Fire Alarms ...	Metropolitan Asylums Board ...	Offices of Board, Embankment, E.C.
,, 26	Swindon—Boiler	Corporation	J. G. Griffin, Electricity Works, Swindon.
	IRON AND STEEL:		
Jan. 19	Sutton, Surrey—Pipes	Urban District Council ...	C. C. Smith, Municipal Offices, Sutton.
,, 20	Rochdale—Ironmongery	Canal Company	Company's Stores, 80 Dale Street, Manchester.
,, 20	Lanark, N.B.—Pipes	District Committee	Warren & Stuart, 94 High Street, Glasgow.
,, 23	Bamford, near Sheffield—Pipes ...	Derwent Valley Water Board ...	O. B. Stewart, Clerk, Bamford.
,, 23	Hastings—Pipes	Corporation	P. H. Palmer, Town Hall, Hastings.
,, 24	London, E.C.—100 Steel-covered Wagons	S. Indian Railway Co., Ltd.	Sir G. B. Bruce, 3 Victoria Street, S.W.
,, 25	Leicester—Steel Roofs	Corporation...	E. G. Mawbey, Town Hall, Leicester.
,, 26	Johannesburg, S.A.—Rails	Municipal Tramways	Mawdey & Dawbarn, 82 Victoria Street, S.W.
,, 26	London, S.E.—Ironmongery, &c.	Lambeth Borough Council	H. Edwards, 346 Kensington Road, S.E.
,, 28	Harrogate—Steel Pipes	Corporation...	E. W. Dixon, 14 Albert Street, Harrogate.
,, 30	Bulcamp, Suffolk—Fire-escape Staircase	Guardians	H. A. Mullens, Clerk, Bulcamp.
March 7	Brisbane, Australia—Rails, &c. ...	——	Agent-General for Queensland, 1 Victoria Street, S.W.
No date	Barrow-in-Furness—Fencing and Gate	Corporation	Borough Engineer's Department, Town Hall, Barrow.
	PAINTING AND PLUMBING:		
Jan. 20	Rochdale—Oils and Paints	Canal Co.	Company's Stores, 80 Dale Street, Manchester.
,, 26	London, S.E.—Oils and Colours	Lambeth Borough Council	H. Edwards, 346 Kennington Road, S.E.
Feb. 6	Manchester, Liverpool, &c.—Painting ...	Lancs and Yorks Railway Co. ...	Engineer's Office, Hunt's Bank, Manchester.
	ROADS AND CARTAGE:		
Jan. 19	Rugby—Roads, &c. ...	Benefit Building Society	J. T. Franklin, Regent Street, Rugby.
,, 20	Willesden—Road-making, &c.	District Council	O. C. Robson, Public Offices, Dyne Road, Kilburn.
,, 20	Birmingham—Kerbs, Setts, &c. ...	Public Works Committee	City Surveyor's Office, Council House, Birmingham.
,, 21	Hailsham—Road Materials, &c. ...	Rural District Council	E. Catt, 17 London Road, Hailsham.
,, 21	Barbon, Westmoreland—Road-widening	Rural District Council	G. B. Atkinson, Jasmine Cottage, Milnthorpe.
,, 23	Beckenham—Making-up Road	Urban District Council ...	J. A. Angell, Surveyor, Beckenham.
,, 23	Camberwell—Paving	Borough Council ...	W. Oxtoby, Town Hall, Camberwell.
,, 24	Tottenham—Making-up Roads	Council	W. H. Prescott, Coombes Croft House, 712 High Road, Tottenham.
,, 24	Bourne, Lincs—Granite and Slag	Rural District Council	A. J. Metcalfe, West Street, Bourne.
,, 24	Bromley, Kent—Road Works	Town Council	Borough Engineer, Municipal Offices, Bromley.
,, 26	London—Road-work and Plate-laying ...	London County Council...	Council's Chief Engineer, County Hall, Spring Gardens, S.W.
,, 26	Pontypridd—Tar-paving Playgrounds ...	Education Committee	P. R. A. Willoughby, Pontypridd.
,, 27	Spilsby, Lincs—Broken Granite ...	Rural District Council	T. A. Bushridge, District Surveyor, Spilsby.
,, 28	Hatfield, Herts—Granite and Slag	County Council	Urban A. Smith, County Surveyor, Hatfield.
,, 28	Sleaford, Lincs—Granite, &c.	Rural District Council	E. Clements, 74 Southgate, Sleaford.
,, 31	Sanghall Massie, Cheshire—Road	Wirral R.D.C.	T. Davies, 33 Kingsland Road, Birkenhead.
	SANITARY:		
Jan. 20	Carlisle—Drainage Works ...	Guardians	G. Armstrong, 24 Bank Street, Carlisle.
,, 21	Levens, Westmoreland—Sewer, &c.	Rural District Council	G. B. Atkinson, Jasmine Cottage, Milnthorpe.
,, 21	Ludlow—Sewerage Works	Town Council	J. H. Williams, Town Clerk, Ludlow.
,, 21	Yeovil—Sewerage Works ...	Rural District Council	A. J. Martin, 7 Victoria Street, S.W.
,, 23	Horsham—Sewage-disposal Scheme, &c.	Rural District Council	A. C. Coole, Solicitor, Horsham.
,, 23	Manchester—Reconstruction of Sewer...	Corporation...	City Surveyor's Office, Town Hall, Manchester.
,, 24	Tendring, Essex—Sewage-disposal Scheme, &c.	Guardians	A. J. Martin, 7 Victoria Street, S.W.
,, 26	Stroud—Manholes, &c.	Rural District Council	Fisher & Milnes, 6 Rowcroft, Stroud.
,, 26	Llandaff—Sewerage Works	Rural District Council	B. Latham, Parliament Mansions, Victoria Street, S.W.
,, 27	Lytham—Sanitary Conveniences on Beach	Urban District Council ...	A. J. Price, Council Offices, Lytham.
,, 28	Sowerby Bridge, Yorks—Sewage-disposal Works	Urban District Council ...	C. L. Whitehead, Holling's Mill Lane, Sowerby Bridge.
,, 30	Windsor—Sewer	Streets Committee	Borough Surveyor's Office, Windsor.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Jan. 30	Swansea—Brick and Flag Plant	——	£1 1s.	Borough Surveyor, 13 Somerset Place, Swansea.
,, 31	Llanelly—Remodelling School Buildings	£20 & £10	——	J. W. Watkins, Education Office, Llanelly.
Feb. 1	Oxford—School	——	£1 1s.	Education Committee, 8 New Road, Oxford.
,, 28	Aylesbury—School	£50 & £25	£1 1s.	C. G. Watkins, Education Offices, Aylesbury.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

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THE ARCHITECTURAL ASSOCIATION.

January 27th. Ordinary General Meeting at No. 18, ufton Street, S.W., at 7.30 p.m. Papers by Messrs. B. FULTON and E. F. REYNOLDS on "Byzantine chitecture."

January 28th. First Spring visit to the Law Society's all, Chancery Lane. Members to meet at the building 2 p.m. A visit will afterwards be paid to the New aiety Hotel and Restaurant. Members to meet at the ilding at 3 p.m.

LOUIS AMBLER
HENRY TANNER, Jr. } Hon. Secs.

EMPLOYMENT REGISTER.

Too late for Classification.

893.—CLERK OF WORKS. Now wkg. on mansion after fire; shortly disengaged.
894.—P.A.S.I.(Bldg. Sub-division) good all-round exp.; wkg. and detail drawings, surveying, &c.; mod. s.
895.—GENERAL OR SHOP FOREMAN OF JOINERS; 1st class exp.; good technical knowledge; thoroughly practical.
896.—ARCHITECT'S ASSISTANT; good draughtsman; surveyor and leveller; 5 yrs. exp.; ex. refs.; 2 yrs. municipal work; in or near London.
897.—QUANTITY SURVEYOR AND BUILDER'S ASSISTANT wants temporary or permanent work; ex. refs.
898.—ARCHITECT AND SURVEYOR'S ASSISTANT (25), wkg. drawings, perspectives, quantities; ex. refs.; mod. s.
899.—PPUMBER, good; can take on new and old work; good refs.; 20 yrs. last job.
900.—ARCHITECT AND SURVEYOR'S ASSISTANT (21), wkg. drwgs., surveying and levelling, &c.; mod. s.; student R.I.B.A.
901.—PLUMBER wants employment, town or country; can turn hand; wages moderate if constant.
902.—HOUSE PAINTER, &c. (36), wants foremanship; 20 yrs. varied exp., 14 yrs. last two masters.
903.—GENERAL FOREMAN (50) seeks re-engagement, 28 yrs. foreman's exp.; carpenter by trade; 1st class refs.
904.—ARCHITECT AND SURVEYOR'S ASSISTANT; 12 yrs. ex.; thoroughly reliable.
905.—GOOD PLUMBER, gas, hot-water and zinc joiner, repairs; draughtsman; estate, institution or builder; 12 yrs. refs.

See p. xxii *for the Employment Register.*

Contracts Open.

NEW GRAMMAR SCHOOL AT FARNHAM, SURREY.
TO BUILDERS.

The Governors of the Farnham Grammar School are prepared to receive TENDERS for the erection of a new Grammar School at Farnham. Drawings, Specification, and a copy of the Conditions of Contract may be seen on application to the Architects, Messrs. Jarvis and Richards, 56, Victoria Street, Westminster, S.W., and Bills of Quantities and Form of Tender may be obtained from them on and after the 23rd JANUARY, 1905, on payment of Two Guineas; the sum so expended will be returned to those persons who send in Tenders in conformity with the conditions specified below.

The Governors do not bind themselves to accept the lowest or any Tender.

TENDERS must be delivered before 12 o'clock noon on the 7th FEBRUARY 1905, addressed to the Clerk to the Governors of the Farnham Grammar School, E. Kempson, Esq., 121, West Street, Farnham, and endorsed "Tender for New Grammar School, Farnham."

E. KEMPSON,
Clerk to the Governors.

BECKENHAM URBAN DISTRICT COUNCIL.
TO CONTRACTORS.

The Beckenham Urban District Council invite TENDERS for the SURFACE DRAINAGE of Kingswood and Mays Hill Roads, Shortlands.

The works consist of the laying of about 4,000 lineal ft. of 9 in. pipes, 250 lineal ft. 12 in. pipes, together with the construction of about 20 manholes and the fixing of 70 stoneware gullies.

Plans and sections may be seen and bills of quantities, specifications, and forms of Tenders obtained on application to Mr. JOHN A. ANGELL, Surveyor, on and after JANUARY 20th, on deposit of £1 (cheques not accepted), which will be returned on receipt of a bonâ-fide Tender.

A clause will be inserted in the Contract providing that the contractor shall pay to the workmen employed in the execution of the work the wages generally accepted as current for workmen engaged on similar work in the district.

Payment under the Contract will not be made until six months after the completion of the works.

Tenders, duly sealed and endorsed "Tender for Drainage Works," to reach undersigned not later than FOUR p.m., MONDAY, FEBRUARY 6th, 1905.

The Council do not bind themselves to accept the lowest or any Tender.

By order,
F. STEVENS,
18th January, 1905. Clerk to the Council.

Miscellaneous.

LIFTS.—WM. AUG.'S GIBSON, LTD., formerly President of American Elevator Co., later Managing Director Otis Elevator Co., Ltd. Temple Bar House, 28, Fleet Street, London, E.C.

BACK NUMBERS WANTED of the BUILDERS' JOURNAL as follows for 8d. each: Vol. IX., Nos. 219, 221, 222 and 223; Vol. XII., No. 290; Vol. XIII., No. 515.—Box 890, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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1. A Free Advertisement of 12 words in the Wanted or Miscellaneous Advertisement Columns, in one issue of the BUILDERS' JOURNAL during each calendar month will be given to any regular reader.

2. The charge of one penny will be made for each additional word.

3. Advertiser's Name and Address or Box Number must be counted, but will in no case be reckoned as more than five words.

4. All advertisements must be accompanied by the correct remittance, and should a receipt be required a stamped addressed envelope must be enclosed.

5. The Proprietors reserve to themselves the right of refusing any advertisement.

II.—Free Answers to Enquiries.

1. The services of a large staff of experts are at the disposal of all regular readers who require information on architectural, constructional or legal matters.

2. Questions should in all cases be addressed to the Editor, and be written on one side of the paper only.

3. Correspondents are particularly requested to be as brief as possible.

4. The querist's name and address must always be given, not necessarily for publication.

Note.—Owing to the large number of enquiries we receive weekly, we are compelled to restrict the advantages of this department to Regular Readers.

III.—Free Accident Insurance of £500.

1. Every regular reader of the BUILDERS' JOURNAL is entitled to the benefit of this Insurance.

2. A Pamphlet giving full details of this and other Insurance schemes inaugurated by the BUILDERS' JOURNAL for the benefit of its readers, and guaranteed by "The Ocean Accident Corporation, Limited," will be sent on application.

What is a Regular Reader?

We have employed the term "Regular Reader" throughout these announcements as the description "subscriber" is often understood to mean one who subscribes direct to the publishing office.

We mean by a Regular Reader anyone who has placed an order with us or any newsagent or bookstall for the BUILDERS' JOURNAL for one year.

Those readers who order the BUILDERS' JOURNAL through their local newsagent or bookstall should send us the newsagent's receipt. Their names will then be placed on our subscribers' list, and they will be entitled to all the advantages set out above.

5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS.
OFFICE: 6, GREAT NEW STREET, FETTER LANE, E.C.

Coming Events.

Wednesday, January 25.

Society of Arts.—The Hon. Robert P. Porter on "London Electric Railways," at 8 p.m.

Edinburgh Architectural Association.—Prof. G. Baldwin Brown on "Old Edinburgh," at 8 p.m.

Thursday, January 26.

Leeds and Yorkshire Architectural Society.—Mr. Thomas H. Mawson, Hon. A.R.I.B.A., on "Garden Design," at 6.30 p.m.

Society of Antiquaries.—Meeting at Burlington House at 8.30 p.m.

Competition Reform Society.—Annual General Meeting, 9, Conduit Street, W., at 5 p.m.

Friday, January 27.

Glasgow Technical College Architectural Craftsmen's Society.—Discussion on "Ventilation," at 8 p.m. (Mr. Isaac Low for "Natural," Mr. J. Lochhead for "Mechanical.")

Architectural Association.—Messrs. J. B. Fulton and E. F. Reynolds on "Byzantine Architecture," at 7.30 p.m.

University College.—Mr. D. S. MacColl on "English Art from Constable to the Present Time," "Historical" and "Genre" painting, Etty, Wilkie, and other Painters, at 4.30 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. T. L. Matthews on "Concrete-making on the Admiralty Harbour Works, Dover," at 8 p.m.

Saturday, January 28.

North of England Institute of Mining and Mechanical Engineers.—Council Meeting at 1.30 p.m.

Builders' Foremen's Association.—Mr. W. T. W. Castell on "Quantities and Measurements," Memorial Hall, Farringdon Street, E.C.

Architectural Association.—First Spring Visit to the Law Society's Hall, Chancery Lane, at 2 p.m., and to the new Gaiety Hotel and Restaurant, at 3 p.m.

Monday, January 30.

Surveyors' Institution.—Discussion on papers on Urban and Rural Building By-laws, at 8 p.m.

Tuesday, January 31.

Northern Architectural Association.—Mr. J. Eadie Reid on "Designing for Mosaics and Stained Glass," at 7.30 p.m.

Architectural Association of Ireland.—Mr. T. E. Hudman on "Irish Abbeys," at 8 p.m.

Thursday, February 2.

Civil and Mechanical Engineers' Society.—Meeting at Caxton Hall, Westminster, at 8 p.m.

Royal Academy of Arts.—Mr. Alfred Gilbert, R.A., on "Sculpture," at 4 p.m.

Society of Antiquaries.—Meeting at Burlington House at 8.30 p.m.

Friday, February 3.

Junior Institution of Engineers.—Prof. H. T. Davidge on "Recent Developments in Electric Lighting," Westminster Palace Hotel, at 8 p.m.

Current Market Prices.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	14	0	2	0	0
Clover, best	per load	3	15	0	4	5	0
Hay, good	do.	3	10	0	3	17	0
Sainfoin mixture ...	do.	3	10	0	3	17	6
Straw	do.	1	12	0	2	2	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ...	per cwt.	1	0	5		—	
Colza Oil, English ...	do.	1	1	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0		—	
Linseed Oil, barrels ...	per cwt.	0	14	$7\frac{1}{2}$		—	
Petroleum, American ...	per gal.	0	0	$5\frac{3}{8}$		—	
Do. Russian ...	do.	0	0	$4\frac{3}{4}$		—	
Pitch	per barrel	0	8	0		—	
Shellac, orange	per cwt.	7	10	0	7	15	0
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	5	0		—	
Tar, Stockholm	per barrel	1	5	0		—	
Turpentine	per cwt.	1	18	0		—	

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ...	per ton	80	0	0		—	
Iron, Staffs., bar ...	do.	6	0	0	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	10	0	10	15	0
Lead, pig, Soft Foreign...	do.	12	17	6	12	18	9
Do. do. English common brands	do.	13	5	9		—	
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14	0	0		—	
Do. pipe	do.	15	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	5	0		—	
Do. floor brads... ...	do.	9	0	0		—	
Steel, Staffs., Girders and Angles	do.	5	10	0	6	0	0
Do. do. Mild bars ...	do.	6	0	0	6	5	0
Tin, Foreign	do.	130	17	6	131	7	6
Do. English ingots ...	do.	132	0	0	133	0	0
Zinc, sheets, Silesian ...	do.	28	0	0		—	
Do. do. Vielle Montaigne	do.	29	0	0		—	
Do. Spelter	do.	25	0	0	25	5	0

TIMBER.

Soft Woods.

		£	s.	d.	£	s.	d.
Whitewood, American, logs.	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	1	6
Fir, Dantzic and Memel	per load	2	7	6	4	15	0
Pine, Quebec, Yellow ...	do.	4	0	0	7	0	0
Do. Pitch, American...	do.	2	10	0	6	0	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, St. Petersburg, Yellow 1st, 3×9	per std.	11	10	0		—	
Do. do. do. do. $2\frac{1}{2}$×7	do.	12	0	0		—	
Do. do. do. 2nd 3×11	do.	9	0	0		—	
Do. do. do. 3rd, 3×11	do.	7	15	0		—	
Do. do. do. do. $2\frac{1}{2}$×7	do.	8	5	0		—	
Do. do. White, 1st, 3×9	do.	10	10	0		—	
Do. Kovda, Yellow, 3rd, 3×9	do.	11	5	0		—	
Do. Petschora, Yellow, 3rd, 3×9	do.	10	10	0		—	
Do. Skelleftea, Yellow, 4th, 3×9	do.	11	5	0		—	
Do. do. do. 5th, 3×9	do.	9	10	0		—	
Do. Ljusne, Dry Yellow, 3rd, 3×9	do.	14	15	0		—	
Do. Sundswall, Yellow and White, $2\frac{1}{2}$×7	do.	6	5	0		—	
Do. Quebec, Spruce, 3rd, 3×9	do.	9	0	0		—	
Battens, all kinds ...	do.	5	15	0	9	10	0

Hard Woods.

		£	s.	d.	£	s.	d
Flooring Boards 1in. prepared, 1st	per square	0	11	3	0	12	3
Do. 2nd	do.	0	9	3		—	
Do. 3rd, &c.	do.	0	7	3	0	9	
Ash, Quebec	per load	4	10	0	7	15	
Birch, New Brunswick...	do.	2	15	0	6	0	
Box, Turkey	per ton	8	0	0	20	0	
Cedar, Cuba	per ft. sup.	0	0	$3\frac{1}{2}$		—	
Do. Honduras ...	do.	0	0	$5\frac{7}{32}$		—	
Do. Tobasco	do.	0	0	$5\frac{3}{32}$		—	
Elm, Quebec	per load	4	5	0	8	15	
Mahogany, Average Price for Cargo, Honduras...	per ft. sup.	0	0	$4\frac{5}{8}$		—	
Do. African ...	do.	0	0	$3\frac{11}{32}$		—	
Do. St. Domingo	do.	0	0	4		—	
Do. Cuba ...	do.	0	0	$6\frac{1}{4}$		—	
Do. Lagos ...	do.	0	0	$4\frac{7}{32}$		—	
Do. Benin ...	do.	0	0	$2\frac{21}{32}$		—	
Do. Tobasco ...	do.	0	0	$4\frac{21}{32}$		—	
Oak, Wainscot	per log.	2	5	0	5	15	
Do. American quartered, planks and boards	per ft. cu.	0	2	6	0	5	
Do Dantzic & Stettin	per load	3	0	0	6	10	
Do. Quebec	do.	5	0	0	8	0	
Teak, Rangoon, planks...	do.	8	0	0	15	10	
Do. Indian logs ...	do.	10	0	0	18	10	
Do. Indian planks ...	do.	13	0	0	20	0	
Do. Moulmein logs ...	do.	6	10	0	8	0	
Kaurie pine logs	per ft. cu.	0	1	6	0	2	
Do. do. planks ...	do.	0	3	0	0	3	

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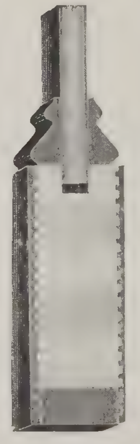

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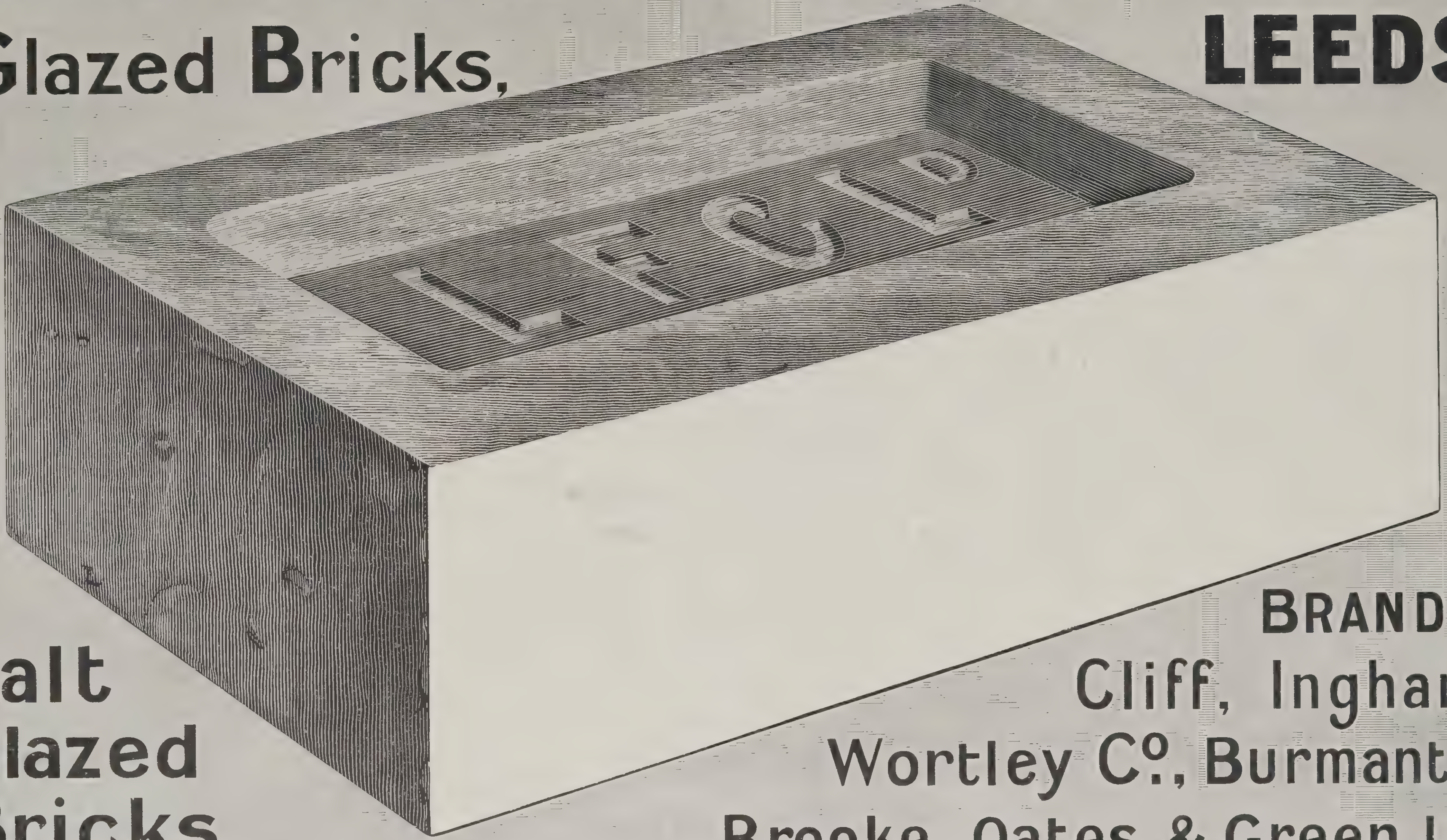

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Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C. Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Bath.—For the enlargement of the station sorting office, for the Commissioners of H.M. Works and Public Buildings :—

				A.
A. Wills & Sons	£1,969	0	0	£90
Hayward & Winter	1 775	0	0	65
J. Long & Sons	1,491	0	0	98
A. J. Colborne*	1,419	4	0	70

* Accepted. A.—Credit for old materials.

Hull.—For the erection of two observation blocks at the sanatorium, Hedon Road, for the Hospital Sub-Committee of the Corporation. Mr. Joseph H. Hirst, city architect :—

G. Houlton	£2,870	0	0
H. Arnold & Sons, Doncaster	2,765	0	0
M. Harper	2,643	18	0
Hull General Builders, Ltd.	2,617	15	9
T. Goates	2,619	0	0
J. L. Levett	2,595	0	0
F. Southern	2,575	0	0
F. Singleton*	2,547	c	0

* Accepted. [Rest of Hull.]

Linslade (near Leighton Buzzard).—For sewerage and sewage-disposal works, for the Linsdale U.D.C. Messrs. Sands & Walker, engineers, Milton Chambers, Nottingham :—

W. H. Wheeler, London	£17,268	0	0
W. G. Wilmott, Rushden	13,991	0	0
J. Jackson, Plaistow	13,188	13	3
S. W. Harrison & Co., Birmingham	12,860	0	0
S. Redhouse, sen., Baldock	12,837	0	0
W. Y. Green & Co., Aylesbury	12,822	0	0
Johnson Brothers, Hereford	12,800	0	0
J. Byroms, Bury	12,623	0	0
G. Mackay & Son, Edinburgh	12,596	11	1
C. Chamberlain, Leicester	12,570	0	0
J. Riley, Cheltenham	12,369	14	10
F. Ray, Bedford	11,969	0	0
J. F. Price, Nottingham	11,850	1	9
T. Yirrell, Linslade	11,815	0	0
A. Jewell, Market Harborough	11,800	0	0
Muirhead, Greig & Matthews, London	£11,702	0	0
Bower Brothers, Nottingham	11,695	0	0
H. H. Barry, Nottingham	11,400	0	0
J. W. Dean, Ltd., London	10,980	0	0
J. J. Rayment & Son, Hertford	10,975	0	0
Siddons & Freeman, Oundle	10,829	0	0
H. Brown,* Watford	10,560	0	0
Haycock & Sons, Leicester	10,380	0	0

* Accepted.

Manchester.—For the erection of a new laundry at Longsight. Messrs. Maxwell & Tuke, architects, 25, Brazennose Street, Manchester :—

J. & J. Parish	£3,159
Normanton & Son	3,145
Daniels & Sons, Pendleton	3,137
Roberts & Son	3,110
J. Bland	3,085
W. A. Peters & Son, Rochdale	3,075
H. Matthews & Sons	2,982
R. Neill & Sons	2,953
Burgess & Galt, Ardwick	2,855
W. Brown & Sons, Salford*	2,850

* Accepted. [Rest of Manchester.]

Norbiton (Surrey).—For the erection of residence, stabling, &c., for Mr. Arthur Billings. Plans, specification and quantities by Mr. W. G. Tutt, surveyor, 18, Ironmonger Lane, E.C. :—

T. Roberts & Co.	£3,970
Penny & Co.	£3,955
Jones	3,890
Adams	3,799
Martin	3,780
Green & Co.	3,777
Baker	3,690
Braid & Co.*	3,672

* Accepted.

Newhaven.—For the erection of an isolation hospi &c., in Lewes Road, for the U.D.C. Mr. F. J. Ray architect, 34, Meeching Road, Newhaven :—

A. White & Sons	£7,353	10	0
J. G. Pickard	6,400	0	0
J. Longley & Co.	6,125	0	0
R. Cooke & Sons	6,045	0	0
J. Jarvis & Son	6,000	0	0
I. Waters & Sons	5,998	0	0
Padgham & Hutchinson	5,935	0	0
Hockley & Co.	5,900	0	0
F. Miskin	5,835	0	0
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Peerless, Dennis & Co.	5,769	0	0
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M. Woolger	5,640	0	0
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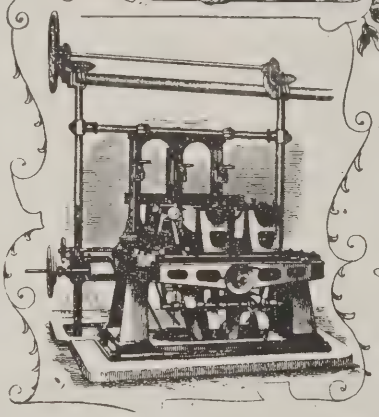

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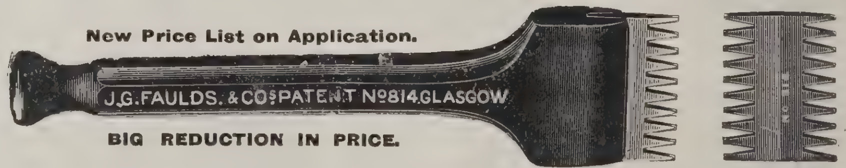

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thamstow.—For alterations and additions to ı Road Schools, for the Walthamstow Education ttee. Mr. H. Prosser, architect, Education ttee Offices, High Street, Walthamstow, N.E. :—

Shelbourne & Co.	£6,507
mpson & Co.	6,498
Shurmur & Son	6,480
easure & Son	6,404
Lawrence & Son	6,383
Knight & Son	6,355
& M. Patrick	6,279
G. Crisp	6,250
llard & Brand	6,250
rtin, Wells & Co., Ltd.	6,119
vall & Upson	6,100
E. Nightingale	6,000
& J. Dean	5,871
ster Brothers	5,822
G. Barton	5,813
ammond & Son	5,775
. Manders	5,550
owley Brothers	5,500
& E. Evans	5,477
. J. Maddison,* Canning Town	5,429

* Accepted.

lectrical Notes.

Automatic Electric Lifts.

ıe electric lift lends itself to operations unattainable by other means of driving, most important being the dispensing an attendant by the use of the auto-c push-button system. Messrs. Archibald ch & Stevens have two systems of this described in their new pamphlet. In the uble-push-button" system there are two ı-buttons in the cage and two on each , one for ascending and one for de-ding in each pair. The button has to be sed till the cage reaches the destination ired, when it immediately stops on ase. The gates can be made to open only n the cage is at the correct level, and cage will not move whilst any gate is ı. Two persons cannot control the lift ultaneously. A possible disadvantage to system is that the speed is somewhat v, but this is overcome with the more plicated "single-push-button" system. cage is fitted with a button for each floor, whilst another is placed on each floor. On pressing the button at any gate the lift is brought to that point and the gate automatically unlocked. The lift will not start again until the gate has been closed, and when one of the buttons in the cage has been pressed the door is automatically locked and the cage starts up or down to the desired floor, where it unlocks the door again. The passenger must on alighting close the door behind him, when the lift is ready to work again for someone else. Means are also taken to prevent more than one person obtaining control. It is not perhaps generally known how much cheaper is the use of an electric lift over that of an hydraulic lift for equal duty.

Electrical Driving of Cotton Mills.

This subject is beginning to receive a very large amount of attention in Great Britain, partly no doubt due to the necessity for introducing economies owing to the operations of cotton financiers, and partly owing to the fact that recent improvements in motors and generating plants have made what was once a doubtful improvement now one of established fact. Recently also electricity has been introduced into many American cotton mills, and papers have been read on the other side of the Atlantic in which highly useful results have been tabulated as regards the undoubted economies. Another advantage is the possibility of using turbo-generators, which take up a very small space as compared with the old-fashioned Corliss engine, whilst the long line of shafts and belting are entirely dispensed with in favour of direct coupling of the motors to the looms, &c. Further, when three-phase current motors are used, these give results as regards constant speed quite unattainable hitherto; but also, by reason of the extreme simplicity of their parts and the absence of brushes and commutators, are much cheaper to handle and easier to maintain. A paper on the subject was recently read before the Manchester section of the Institution of Electrical Engineers by Mr. H. W. Wilson, who gave some interesting data regarding power costs. In a well-arranged electrically-driven mill the cost of producing energy, after allowing 5 per cent. interest and 10 per cent. depreciation, is about ·3d. to ·35d. per unit, giving a result of about £2 14s. per electrical horse-power-year. These figures should, however, be capable of improvement if the mills were to take power from a large central power station, and although they would only be running during the daytime the cost of generating would be considerably reduced if by the offer of special terms other manufacturers could be induced to take energy during the dark hours.

Electrical Power in the Post Office.

It is perhaps not generally known that the Post Office and Telegraph Departments at St. Martin's-le-Grand use a large amount of electrical power for lighting, for pneumatic tubes and for charging batteries. The ordinary Daniell cells which formerly provided the current for telegraphic purposes, and of which thousands were in use, have been largely superseded by accumulators, but the plant at the Post Office is not large enough to cope with the demands for this purpose, for the large extensions of lighting, and for the extra power required to provide the compressed air for the pneumatic tubes. These last have effected large economies in the transmission in the metropolis of quantities of telegrams at a time, and although there are about 42 miles of pneumatic tubes radiating to distances of 2 to 2½ miles this is not enough and it is proposed to lay down about another 20 miles of tube when more power is available. This will be provided by a new central power station, to be built on the Surrey side of the Thames opposite the Temple, where three-phase plant of a capacity of 2,000 kilowatts will be installed. It is expected that this plant will be working in the summer of next year.

A.M.I.E.E.

The Edison & Swan
United Electric Light Company, Limited,
36 & 37, QUEEN STREET, CHEAPSIDE, LONDON, E.C.
West End Warehouse and Showrooms: 60, GREAT MARLBOROUGH STREET, REGENT STREET, W.
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For 3/- we give three insertions (four lines) in our "Appointments Wanted" column (*see* page xvi), and also six insertions belo

Instructions.—Advertisers must furnish their names and full addresses, a number being assigned to each for identification. communications will be treated in the strictest confidence. Abbreviations employed :—s., salary ; ex., experience ; refs., references ; yrs., yea

ARCHITECTS' ASSISTANTS.

386.—ARCHITECT, with own office, can assist with perspectives, designs, working drawings and quantities.

843.—ARCHITECT'S ASSISTANT, good draughtsman, fully qualified, artistic, sal. 30s., ex. refs.

846.—JUNIOR ASSISTANT (24). Tracing, inking in and colouring, 5 yrs City exp. West London pref.

847.—ARCHITECT'S ASSISTANT, A.R.I.B.A. Wide exp. in provincial work. Design, details, quantities. ex. refs., mod. s.

848.—ARCHITECT'S ASSISTANT, surveys, levelling, details, quantities. Honours Building Construction. Clerk of Works, sal. 25s.

851.—ARCHITECT'S JUNIOR ASSISTANT, measuring up, plotting, and knowledge of construction.

860.—ARCHITECT'S JUNIOR ASSISTANT, 3½ yrs. exp. in London, mod. s.

862.—YOUNG ARCHITECT, M.S.A., ex. qualifications and refs. Varied exp., design specifications, quantities and surveying.

863.—ARCHITECT'S ASSISTANT, 9 yrs. varied exp., contract and detail drawings, perspectives. Ex. refs., mod. s.

865.—ARCHITECT'S JUNIOR ASSISTANT, age 23, wants London appt., 4½ years' exp. Good refs., mod. s.

868.—ARCHITECT'S ASSISTANT (23), 7 yrs. exp. Design, details, surveying, levelling, good refs.

870.—ARCHITECT AND SURVEYOR'S ASSISTANT, good surveyor and draughtsman, all-round exp., mod. s.

872.—ARCHITECT'S ASSISTANT, 9 yrs. London exp. Drawings, details, perspectives, specifications, domestic and Renaissance work, mod. s. good refs

877.—ASSISTANCE rendered with competition, detail and working drawings. Competent man. Honours Building Construction, Prizeman S. Th.

878.—ARCHITECT & SURVEYOR'S ASSISTANT. London or district, 12 yrs. varied exp.,

879.—ARCHITECT'S JUNIOR ASSISTANT, neat draughtsman. Tracer and colourist.

881.—ASSISTANCE rendered in taking off quantities. Also variations, specifications and accounts. 12 yrs. exp. London. Mod. terms.

883.—ARCHITECT'S ASSISTANT (25), 9 yrs. exp. in Midlands and Wales 1 year with C.C. Designer ; good refs.

884.—ARCHITECT AND SURVEYOR'S 1ST CLASS ASSISTANT undertakes work by day or week.

886.—ARCHITECT AND SURVEYOR'S ASSISTANT. A.R.San.Inst., 9 yrs. exp. Contract drawings, details, specifications, surveying and levelling.

888.—ARCHITECT'S ASSISTANT (24). Good exp. an refs. Design, working drawings, details and perspectives, quantities, specifications, &c.

889.—ARCHITECT'S ASSISTANT, 14 yrs. good exp. in large London office, good refs. Sal. £2 15s.

CARPENTERS AND JOINERS.

839.—STAIRCASE HAND AND HANDRAILER. Plans and specification work. Go setter out.

CLERK OF WORKS.

866.—CLERK OF WORKS. Good refs., shortly disengaged.

CLERKS.

861.—BUILDER'S CLERK wants two days per week, abstracting, p.c., a jobbing acs.

869.—BUILDER'S CLERK AND DRAUGHTSMAN (23), wkg. and detail drawin tracings, quantities, estimating. contract and jobbing.

873.—BUILDER'S ESTIMATOR and Measuring-up Clerk (37), good busin abilities and sound knowledge of trade.

882.—BUILDER AND CONTRACTOR'S CLERK. P.C. accounts, book-keepi drawing, and quantities and estimating, ex. refs.

887.—BUILDER'S CLERK AND ASSISTANT. Life exp. jobbing work. Estimat decorating and sanitary work, good refs., mod. s. Could manage.

DESIGNERS, TRACINGS, &c.

844.—EXPERIENCED DRAUGHTSMAN renders assistance in evening with w drawings, details, &c. Terms mod.

849.—PERSPECTIVES, ink, wash or colour, and assistance with designs a competition work.

FOREMEN.

834.—SUPERVISOR for dept. in Modelled Fibrous Plaster Ceiling or Carton Pier establishment.

880.—GENERAL FOREMAN, 35, good manager and organiser, used to West E Experienced. Trade, joiner ; abstainer.

MISCELLANEOUS.

867.—MONUMENTAL LETTER CUTTER, age 39, carver and mason, long ex drawing and modelling.

871.—WATCHMAN OR CARETAKER, 18 yrs. refs., married, would pay security permanency.

885.—STONE TURNING by exp. man, day or piecework. Balusters and finial speciality.

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845.—QUANTITY SURVEYOR'S ASSISTANT, ex. refs.

For "Too Late for Classification" see page xvii.

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ldressed postcards on which lists of tenders may be d will be sent post free on application to the Manager, .DERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

hippenham. For sewerage and sewage-disposal s. Mr. A. E. Adams, A.M.I.M.E., engineer, High et, Chippenham :—

R. H. B. Neale, Ltd., Plymouth	£17,046	0	0
W. Webb, Bath	16,666	0	0
H. Ash, Devizes	14,959	0	0
J. Jackson, Forest Gate, E.	14,664	2	8
J. & M. Patrick, Wandsworth	13,999	0	0
W. C. Shaddock, Plymouth	13,945	17	10
J. & T. Binns, Bristol	13,797	17	10
G. Bell, Tottenham	13,155	0	0
J. F. Osman, Southampton	12,998	0	0
Bird & Pippard, Yeovil	12,957	0	0
Downing & Rudman, Chippenham	12,877	0	0
Johnson & Langley, Leicester	12,860	8	11
S. Wood, Bristol	12,764	1	3
Pethick Brothers, London	12,700	0	0
Grounds & Newton, Bournemouth	12,700	0	0
S. Roberts, Plymouth	12,600	16	8
Hodson & Son, Ltd., Nottingham	12,566	5	7
Muirhead, Greig & Matthews, London, E.C.	12,482	15	9
W. H. Strickland, Paddington	12,453	0	0
E. Powell, Cardiff	12,311	15	7
S. W. Harrison & Co., Birmingham	12,081	0	0
ohnson Brothers, Hereford	12,049	0	0
Moran & Son, Westminster	12,000	0	0
. Riley, Cheltenham	11,999	17	0
B. Firth & Co., York	11,879	3	11
H. Ashley, Mansfield	11,708	3	10
Free & Co., Bristol	11,564	11	6
E. Ireland,* St. John's Road, Morecambe	11,550	2	9
A. J. Colborne, Swindon	10,799	17	7

* Accepted.

[Engineer's estimate, £11,148 18s. 4d.]

tham (Kent).—For proposed new stabling, for Messrs Tilling, Ltd. Messrs. Gilbert & Constanduros, tects, 43, Finsbury Square, E.C. Quantities by rs. Batstone Brothers, 110, Cannon Street, E.C. :—

Whistler & Worge	£7,202	0	0
W. H. Wagstaff	6,352	0	0
F. G. Minter	6,224	0	0
T. Rider & Son	6,078	0	0
W. Downs	6,035	0	0
Holliday & Greenwood	5,922	0	0
Todd & Newman	5,892	0	0
. Greenwood, Ltd.	5,868	0	0
. P. Roberts	5,842	0	0
). & R. Kennard	5,839	0	0
Knight,* Sidcup	5,813	10	0

* Accepted.

ndsworth.—For the erection of public baths in e Lane, boilers, machinery, heating apparatus and engineering work, for the U.D.C. Mr. John P. rne, F.R.I.B.A., architect, 95, Colmore Row, ingham :—

. H. Marshall, Smethwick	£17,400
. Moftat & Sons, Camp Hill	17,400
I. Wilcock & Co., Wolverhampton	16,885
. Griffiths, Lye	16,750
V. Jackson, Langley	16, 00
. E. Harper	16,720
. A. Horton, Brierley Hill	15,994
Dallow & Sons, Blackheath	15,950
. Parnell & Sons, Rugby	15,888
. Rowbotham, Birmingham	15,885
. Langley Tyburn	15,750
V. Bishop, King's Heath	15,687
. Webb	15,655
E. Hopkins, Birmingham	15,500
V. Sapcote & Sons, Birmingham	15,488
Barnsley & Son, Ladywood	15,388
V. H. Gibbs, King's Heath	15,151
A. Turton, Birmingham	15,099
V. & J. Wabb, Birmingham	15,044
V. Lee & Son, Aston	14,999
Webb	14,989
owing & Ingram, Birmingham	14,793
. Whitehouse & Sons, Birmingham	14,571
. Elvins	14,470

[Rest of Handsworth.]

ll.—For work in connection with basement and facing Waterworks Street and Carr Lane, forming f the public hall, for the Corporation. Mr. Joseph rst, city architect :—

Sangwin	£15,952	10	1
Bowman & Sons	£15,650	0	0
Arnold & Sons, Doncaster	15,460	0	0
E. Good & Sons	15,450	0	0
F. Beilby	15,299	0	0
T. Goates	15,290	0	0
Hebblewhite & Wilson	15,268	15	9
G. H. Panton, Anlaby Road*	15,268	15	9

* Accepted. [Rest of Hull.]

London, N.—For the erection of a new section house at Edmonton. Mr. J. Dixon Butler, surveyor to the Metropolitan Police, architect. Quantities by Messrs. Thurgood, Son & Chidgey, Duke Street, Adelphi, W.C. :—

A. Hood	£4,200
Holloway Brothers	3,829
C. Ansell	5,821
Grover & Sons	3,796
Spiers & Sons	3,748
W. Eyre	3,722
Lascelles & Co.	3,720
Lathey Brothers	3,669
A. Monk	3,650
Willmott & Sons	3,649
Stapleton & Son	3,636
Higgs & Hill	3,588
Fairhead & Son	3,284
Lawrence & Son	3,274
Knight & Son	3,227

London, N.W.—For roads and sewers at Golder's Green (first portion), for the Golder's Green (Finchley Road) Estate, Ltd. Mr. H. J. S. Abrams, surveyor :—

W. Neave & Son	£4,425
J. Mowlem & Co., Ltd.	4,405
S. Kavanagh & Co.	4,377
E. Rogers & Co.	4,235
T. Adams	4,114
R. Ballard, Ltd.*	3,950

* Accepted.

London, S.E.—For the erection of new Baptist church, Shooter's Hill Road, Blackheath. Mr. S. S. Dottridge, Albert Buildings, Queen Victoria Street, and Messrs. Thompson & Walford, Leadenhall Buildings, joint architects:—

F. & H. F. Higgs	£6,900
Higgs & Hill	6,444
Holliday & Greenwood	6,377
Kennard Brothers	6,328
J. & C. Bowyer	6,280
J. & W. Falkner & Son	6,210
W. Akers & Co.	6,163
Holt & Son	£6,150
Wallis & Son	6 144
J. & H. Roberts	6,139
Batley, Son & Holness	5,987
Patman & Fotheringham*	5,983

* Recommended for acceptance.

London, S.E.—For alterations and interior fittings to 240, High Road, Lee, for the London and South-Western Bank, Ltd. Mr. C. L. Morgan, architect 43, Cannon Street, E.C., and 2, Station Chambers, Haslemere, Surrey :—

Lascelles & Co.	£1,297
Courtney & Fairbairn	1,145
General Builders, Ltd.	1,087
J. Grover & Son*	1,067

* Accepted.

Londonderry — For the erection of a municipal technical school. Mr. Daniel Conroy, architect, 21, Shipquay Street, Londonderry. Quantities by Mr. W. M'Elwee, 36, William Street, Londonderry :—

A. Maultsaid, Londonderry	£10,300	0	0
Shannon & Rutledge, Londonderry	9,223	10	0
Campbell & Son, Belfast	8,984	0	0
Smith Brothers, Londonderry	8,938	4	8
Robert Colhoun, Londonderry	8,775	0	0
J. & W. Stewart, Belfast	8,490	0	0
Ballintine, Londonderry	8,449	2	2
Courtney & Co., Belfast	8,390	0	0
Laverty & Sons, Belfast and Derry	8,200	0	0
M. Sweeney,* Londonderry	7,236	10	3

* Recommended for acceptance.

Maidstone.—For the erection of premises for the London and Provincial Bank in Middle Row :—

H. E. Phillips, Gillingham	£4,650
Cox Brothers	4,485
West Brothers, Strood	4,468
T. Elmore & Sons	4,397
R. Avard	4,345
G. E. Wallis & Sons*	4,314

* Accepted.

Maidstone.—For rebuilding the corner of Mill Street, for Mr. Henry Payne :—

G. Pearce & Sons	£3,125
Corben & Co.	2,989
R. Avard	2,933
G. E. Wallis & Sons	2,872
Cox Brothers*	2,870

* Accepted.

Middlesbrough —Accepted for the erection of new schools in Marsh Road, for the Corporation :—

Thomas Dickinson & Son	£6,150

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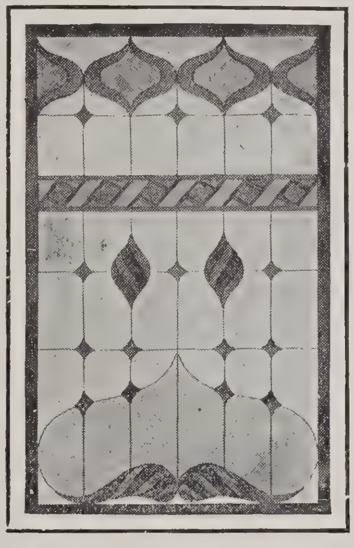

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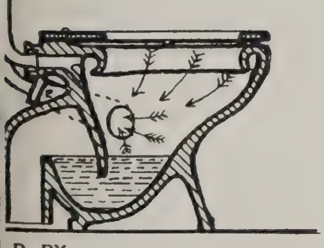

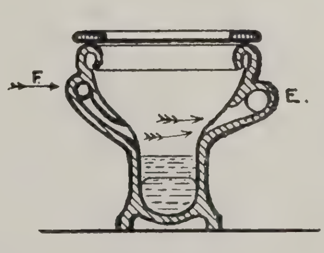

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Near LEEDS, YORKS.

From whom all particulars can be had on application.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

During the week ending January 13th twenty-two failures in the building and timber trades in England and Wales were gazetted.

T. Dewey, builder, Itchen. R.O. Jan. 7th.

Flew & Co., builders, Kensington. Adj. Jan. 2nd.

J. Day, builder, Wolverhampton. Adj. Jan. 2nd.

B. Haynes, builder, Croydon. Adj. Jan. 6th.

F. Kemp, builder, Hove. R.O. Jan. 5th.

E. W. Sanders, builder, Rottingdean. R.O. Jan. 7th.

D. Roberts, late builder, Manchester. P.E., Salford C.C., Jan. 30th, at 11.

J. C. Berry, builder, Lewes. P.E., Lewes County Hall, Feb. 1st, at 11.30.

T. Norrell, builder, Chadwell Heath and Manor Park. Adj. Jan. 5th.

T. J. Harrop, joiner and contractor, Rotherham. Adj. Jan. 6th.

T. Phillips, contractor, Birdwell, near Barnsley. R.O. Jan. 3rd.

D. J. Davies, builder and contractor, Blaengarw. R.O. Jan. 2nd.

A. J. Geary, builder, Burton-on-Trent. Gross liabilities £4,036; assets £1,275; deficiency £188.

W. Newlove, builder, Hull. Liabilities £1,368; assets £1,557; estimated surplus £189.

W. Mottram & Son, builders' merchants, Sheffield. Liabilities to unsecured creditors £1,377; one creditor fully secured £5,500; estimated surplus £1,950.

T. Moon, slater and tiler, Clay Cross. First meeting, O.R.'s, Derby, Jan 19th, at 11. P.E., Chesterfield C.C., Jan. 20th, at 2.

Parker & Co., builders, decorators, &c., Manor Park. First meeting, London Bankruptcy Court, Jan. 23rd, at 12. P.E., same, Feb. 17th, at 11.30.

J. Farrer, builder, Cartmel. First meeting, O.R.'s, Barrow-in-Furness, Jan. 20th, at 11.30. P.E., Magistrates' Court, Barrow, Feb. 1st, at 3.

J. Charters, builder and contractor, Leeds. R.O. Jan. 6th. First meeting, O.R's., Leeds, Jan. 19th, at 11. P.E., Leeds C.C., Jan. 31st, at 11.

J. E. Bowen, builder, Garnant. First meeting, O.R.'s, Carmarthen, Jan. 21st, at 12. P.E., Carmarthen Guildhall, Feb. 8th, at 12th.

J. O. Lewis & Son, builders and contractors, Maesteg. First meeting, 117, St. Mary Street, Cardiff, Jan. 19th, at 3. P.E., Cardiff Town Hall, Feb. 6th, at 11.

A. Hodges, stonemason, Clacton-on-Sea. Gross liabilities, £2,947; £391 expected to rank for dividend; assets, £135; deficiency, £272.

H. Good, late brick and tile merchant and building contractor, Grimsby. Gross liabilities £8,352; £2,249 expected to rank; deficiency £1,274

T. Bagnall & Sons, builders, Langley and Oldbury. First meeting, 191, Corporation Street, Birmingham, Jan. 20th, at 11. P.E., West Bromwich Law Courts, Jan. 23rd, at 10.30.

Woolpit Brick Co., Ltd. A winding-up order has recently been made against this company. Loss on trading since formation of company in 1899, £31,000. Liabilities £39,830 (£18,059 unsecured); no available assets after satisfying the debentures; deficiency £68,047.

Coming Events.

Wednesday, January 18.

Royal Philosophical Society of Glasgow (Joint Meeting with the Glasgow Architectural Association).—Prof. Eugene Bourbon, B.A., A.D.F.G., on "The Education of the Architect," at 8 p.m.

Edinburgh Architectural Association.—Mr. Mathew Buchan on "The Electric Lighting of a Country House," at 8 p.m.

Chemical Society.—Meeting at 5.30 p.m.

Institution of Civil Engineers.—Students' visit to Young & Co.'s Ironworks, Nine Elms Lane, S.W., at 3 p.m.

British Archæological Association.—Meeting at 32, Sackville Street, W., at 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Annual Meeting at 8 p.m.

Thursday, January 19.

Society of Architects.—Mr. T. R. Croger on "Some Historic Buildings in the City of London." Staple Inn Buildings (South), Holborn, at 8 p.m.

Society of Antiquaries.—Meeting at Burlington House at 8.30 p.m.

Camera Club.—Dr. J. A. Ewing on "The Structure of Metals," Charing Cross Road, at 8.15 p.m.

Friday, January 20.

Institution of Mechanical Engineers.—Four papers on "American Workshops and Machinery," at 8 p.m.

Architectural Association (Old Day Students' Club).—Fourth Annual Dinner, Florence Restaurant, Rupert Street, W., at 7.30 p.m. (Chair, Sir Aston Webb, R.A.)

Monday, January 23.

Surveyors' Institution (Junior Meeting).—Mr. C. H. Dinwiddy on "Rating and Possible Legislation," at 7 p.m.

Royal Institute of British Architects.—Mr. James Ransome, F.R.I.B.A., on "European Architecture in India," at 8 p.m. Award of Prizes and Studentships.

Royal Geographical Society.—Mr. Richard N. Hall on "The Great Zimbabwe and Other Ancient Ruins in Rhodesia," the Theatre, Burlington Gardens, at 8.30 p.m.

London Institution.—Mr. Hugh Stannus on "Architecture from Egypt to Rome," at 5 p.m.

Tuesday, January 24.

Northern Architectural Association (Students' Evening).—Mr. W. E. Bland, M.I.S.E., on "External Plumbing," at 7.30 p.m.

Wednesday, January 25.

Society of Arts.—The Hon. Robert P. Porter on "London Electric Railways," at 8 p.m.

Edinburgh Architectural Association.—Prof. G. Baldwin Brown on "Old Edinburgh," at 8 p.m.

Thursday, January 26.

Leeds and Yorkshire Architectural Society.—Mr. Thomas H. Mawson, Hon. A.R.I.B.A., on "Garden Design," at 6.30 p.m.

Society of Antiquaries.—Meeting at Burlington House at 8.30 p.m.

Friday, January 27.

Glasgow Technical College Architectural Craftsmen's Society.—Discussion on "Ventilation," at 8 p.m. (Mr. Isaac Low for "Natural," Mr. J. Lochhead for "Mechanical.")

Architectural Association.—Messrs. J. B. Fulton and E. F. Reynolds on "Byzantine Architecture," at 7.30 p.m.

University College.—Mr. D. S. MacColl on "English Art from Constable to the Present Time," "Historical" and "Genre" painting, Etty, Wilkie, and other Painters, at 4.30 p.m.

Saturday, January 28.

North of England Institute of Mining and Mechanical Engineers.—Council Meeting at 1.30 p.m.

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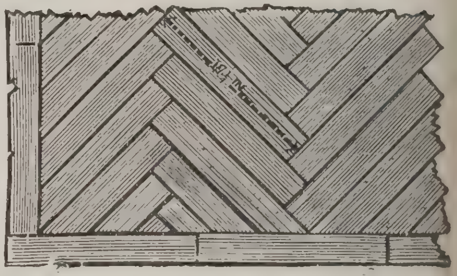

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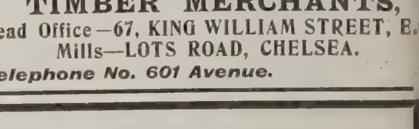

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MONTHLY
FIRE SUPPLEMENT
TO THE
BUILDERS' JOURNAL AND ARCHITECTURAL RECORD.

Edwin O. Sachs, F.R.S.Ed., Architect,
Consulting Editor.

Number 3.
January, 1905.

SUMMARY.

The ultimate value of all fire-resisting buildings is that of their weakest part, and it is in this respect that the new Entrepôt Royal (or Government Bonded Stores) at Antwerp is defective. Though most admirably designed and executed as a whole, with façades and dividing walls in brick, and ceilings, columns and terraces of reinforced concrete, there appears to be an insufficient covering of concrete over the metal rods, the doors to the lift wells do not close properly, and openings of about 9ins. diameter have been left in the floors and walls. (Page 38.)

A report on the first independent test of a sprinkler, after having passed through the usual Fire Office test, is given on p. 46.

Loud-sounding gongs are now adopted by the London Fire Brigade instead of the old method of shouting. (Page 47.)

A special "dangerous structure" trap is used in Munich, fitted with crowbars, spades, jacks and numerous other appliances. (Page 48.)

The "fire watches" in the Berlin theatres are undertaken by the Royal Police Fire Brigade, who drill daily, employing a number of "dummies." (Page 45.)

The fire-curtain at the Crouch End Opera House, which was destroyed on Christmas Eve, was not, apparently, of asbestos cloth, but of two thicknesses of canvas painted with asbestos paint. (Page 45.)

A fire testing station at Columbia University has been organized. (Page 46.)

Tests with electro-glazed casements, a concrete floor and an automatic fire-alarm system are to be conducted by the British Fire Prevention Committee to-day. (Page 46.)

The International Fire Service Council constituted in 1900 with the primary objects of serving as an enquiry office as a centre for the issue of statistical reports of international importance, and systematizing the International Fire Congress arrangements, is gradually becoming a very representative institution. Great Britain has twelve representatives on the Council. (Page 42.)

In America there are excellent provisions to ensure safety from fire, but these are wilfully ignored, and hence such disasters occur as at the Iroquois Theatre, Chicago. (Page 44).

The Granolithic floors at Cranston's Hotel, Southampton Row, London, broke the force of the gas explosion which occurred recently in the basement of a shop under the hotel and resisted the fire which succeeded, and saved the hotel from serious damage. (Page 42.)

THE HORNE BUILDING FIRE AT PITTSBURG.

AT a time when questions of fire-resisting construction are being considered from every possible aspect, there can be no more valuable data presented than that which refers to actual fires. It is practically immaterial what the date of the fire may be, as long as it has been carefully reported upon and well illustrated by photography.

It is for this reason that we are in this number reproducing some excellent illustrations and some useful technical particulars regarding the great Horne building fire of some years ago, which served as such an interesting example, but which was scarcely sufficiently studied at the time owing to the problem of fire-resisting construction not having been given that attention in this country at that period which it now enjoys.

Directly after this fire at the Horne building in Pittsburg, U.S.A., the insurance companies interested instructed their representatives to make a careful investigation on the spot, and to report as far as possible the actual facts and also present their opinions in the form of notes. A committee was constituted and the report prepared, and it is this report which we have before us.

The report was presented *in extenso* with many diagrams and numerous tables as far back as 1898.

It would indeed be well if such excellent reports were obtainable in respect to fires in the British Isles as were prepared as far back as 1898 by insurance men in Pittsburg, and have since then been also prepared by insurance offices in respect to such conflagrations as the Baltimore and Rochester fires of the United States.

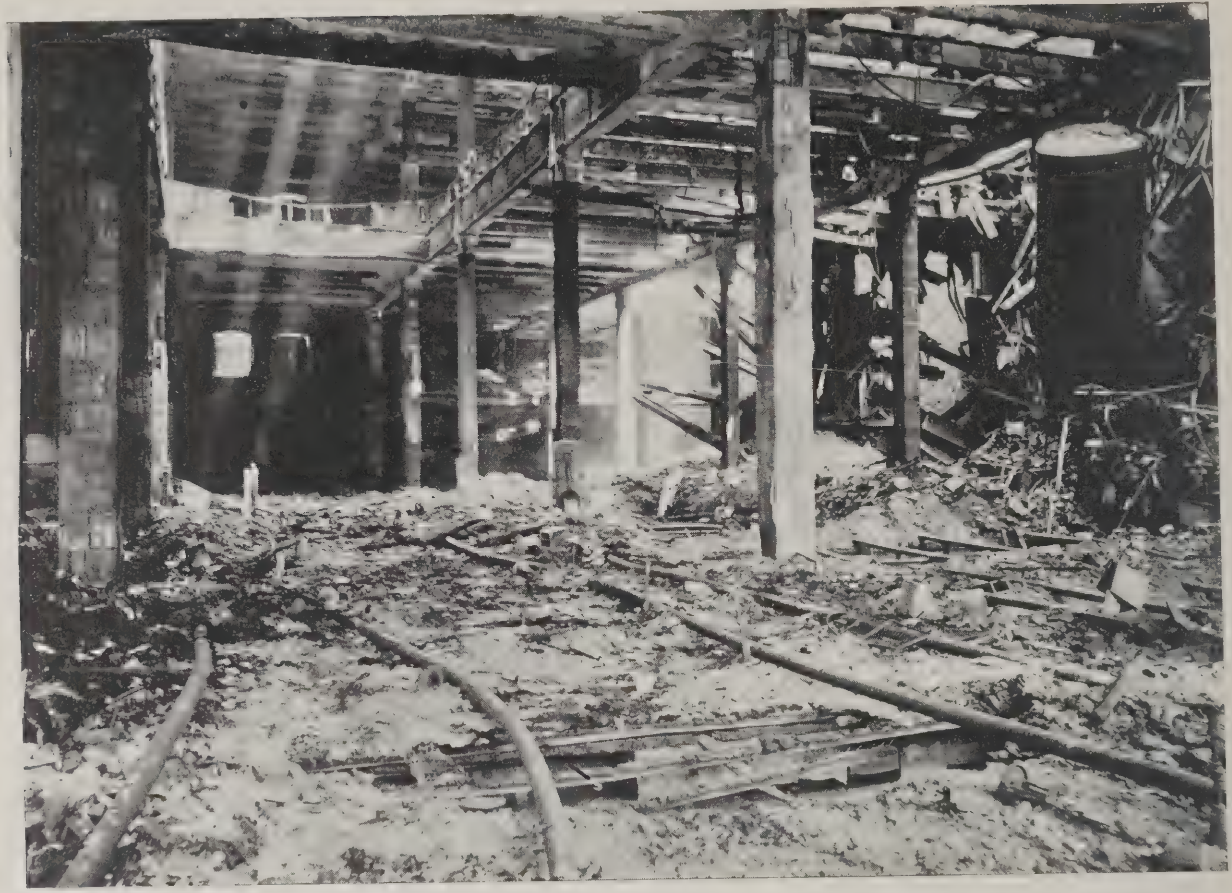
The Fire.

A map of the burned district is shown on p. 34. For a graphic account of the fire we quote from the "Engineering World" of U.S.A. as follows:—

"According to the best available information, the night watchman for T. C. Jenkins's grocery store first became aware of fire while making his rounds at 11.45 p.m., but it was some little time before he finally located it in a barrel of paper, rags, scraps from the employees' dinner baskets and similar refuse which stood at the bottom of the elevated shaft. For some time—about fifteen minutes as estimated by the watchman—he fought the fire with a chemical fire extinguisher. Finding his efforts to be to little purpose and the flames rapidly ascending the elevator shaft, the watchman sent in a call for the fire department. The engines responded promptly, but so great had been the previous delay that the time of their arrival was 12.20 a.m. Ten minutes later the flames burst through the windows of the building, and at 12.45 o'clock every floor was burning fiercely, the flames apparently being fed by the large stores of oil, sugar, molasses, hams, &c., with which the building was filled. The firemen had for some time previous abandoned the hope of saving the Jenkins building, and had turned their streams upon the large dry goods store of Joseph Horne & Co. and the neighbouring office building, also belonging to Joseph Horne & Co. Despite their efforts, however, the woodwork of both these buildings near the tops began to burn at about 1 o'clock, and a few minutes later the flames from the Jenkins building had leaped the street and set fire to the inflammable contents of the dry-goods store windows. At almost the same time the office building began to burn. From this time on the spread of the fire was rapid, and a few minutes, according to reports, were sufficient for both the office and the store buildings to become a mass of flames so fierce as to drive the firemen from Penn Avenue and Fifth Street to the roofs of the buildings surrounding the fire. From these points of vantage at the rear of the Horne buildings on the far side of Fifth Street, and from the windows of the Methodist Book building, the firemen directed their streams and prevented the flames from crossing Fifth Street or reaching the rear of the Horne buildings, but the narrower Cecil Avenue was passed. The new Phipps office building was badly scorched, and the Methodist Book building above the fourth floor was completely gutted of its contents. In approximately two hours from the time of its first discovery, therefore, the fire had destroyed the three larger buildings of the group shown on the site plan, a half dozen smaller structures, and had damaged severely a number of other structures adjacent to the centre of the conflagration."

The Building.

The Horne Store building was a building 177ft. long and 118ft. wide centre to centre of columns. The building was of modern steel construction, all walls being carried upon the extended cap plates of the columns. To the sides of the girders were attached shelf angles. Upon these the floor beams were supported and were riveted thereto by two $\frac{3}{4}$in. rivets. The floor beams were generally about 5ft. apart centre to centre, and consisted of single 15in. 50lb. I beams. The sixth storey columns were connected longitudinally by means of 20in. 64lb. I beams. To the top of these were riveted the roof beams, consisting of 10in. 25lb. I beams, spaced 5ft. apart. Upon the roof beams were laid 5in. 3·7lb. T's, spaced 18ins. apart, and upon which were laid book tile to form the roof. From the roof beams the ceiling was suspended by means of $\frac{3}{8}$in. rods. These rods were 12ins. apart, transversely, and carried at their lower ends $1\frac{1}{2}$in. 2·5lb. T's. The length of the rods in the front of the building was 9ft. and in the rear of the building 3ft., thus forming a horizontal ceiling. Upon the ceiling tees were also



INTERIOR VIEW OF THE HORNE BUILDING AFTER THE FIRE.

laid book tiles. There was no protection given to the bottom side of the ceiling tees other than the plaster.

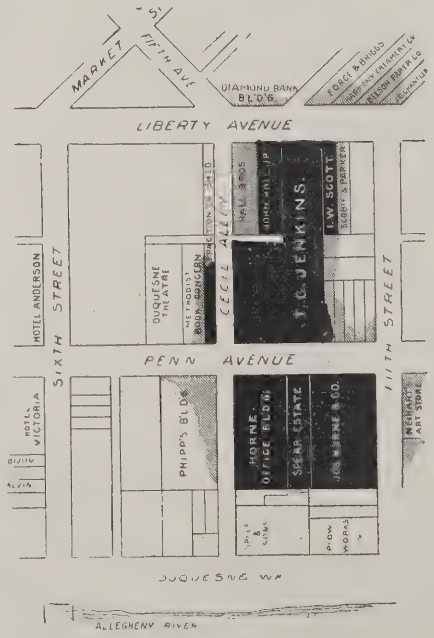
All the steelwork was covered by hard clay tile (terra-cotta), as shown in our illustrations. The floors were constructed of hard clay tile arches (terra-cotta) and were of the side construction type. The bottom of the beams and girders were protected by terra-cotta, which was attached to the same by means of sheet-iron strips, and for which there was no protection except that given by the plaster. The column protection consisted of hollow hard clay tile, which was put on in a manner much better than usual.

Effects of the Fire.

The general effect of the fire on the building is clearly shown on the accompanying photographs, which were kindly furnished to the British Fire Prevention Committee by the "Insurance World" of U.S.A.

The wreck of the eastern side of the building was caused by the falling of the water tank, weighing when filled 26 tons. This was supported by I beams, the dimensions of which could not be ascertained. Judging from the warped and weak condition of the remaining ceiling tees in the western part of the building, a fair surmise would be that the ceiling underneath the tank, which was located right outside the elevator shaft, gave way under the heat, which there was, no doubt, fiercer than at any other place in the building. The fall of the ceiling exposed to the action of the heat the unprotected columns of the sixth storey between the ceiling and the roof, and also the roof beams and those supporting the tank. These no doubt yielded on account of their loads and the action of the heat, and thus permitted the heavy tank to fall. The tank in falling carried with it to the first floor such columns and beams with which it came in contact, and which in turn dismantled a number of beams and girders to which they were connected.

Walls.—The east and west walls were examined to determine the amount that they were out of plumb by means of a fine transit instrument in perfect adjustment. South-west corner: From the ground floor to second floor the corner was plumb. From the second floor to fifth floor it leant towards Fifth Street, or westward, 2ins. The wall was perfectly plumb in the other direction, *i.e.*, it did not lean towards or from Penn Avenue. North-west corner: From the ground floor to second floor the corner leant northward 1½ins. From the second floor to the fifth floor the building was plumb. East wall: The upper portion of this wall bulged badly, and some part of it was gone; other parts of the wall appeared plumb



SITE PLAN.

Columns.—Each column in the building was first examined with the transit instrument, and then the results of this examination were verified by plummet observations, together with a close visual scrutiny. These results were then tabulated, but the presentation of these figures would lead too far. A general statement of these observations would be that the whole tiers were from 1in. to 2ins. out of plumb, and that the intermediate columns were on different sides of the plumb line. Tiers of columns, therefore, were in a sinuous condition, but the greatest deflection at any point in the whole tier would not be more than 2ins.

Girders and beams.—The girders and beams were also subjected to close scrutiny and a careful record made and tabulated. Every rivet on the building that was exposed was tapped, and not one loose rivet was found. All connections were also examined, and were all found to be in good condition as far as could be determined, with few exceptions.

Steel.—To determine to what extent the steel had been injured by the fire and what beams could be safely straightened, three very badly twisted beams were selected and test pieces were cut out as close to the bend as possible. The results of the tests were that, regardless of how badly bent the sections were, the material was in no case injured.

Technical Notes by the Special Committe of Insurance Experts.

The following notes were issued by the Special Committee of Insurance Experts:—

1st. "In buildings of about this height the distortion of the steel framework due to the heat of the fire cannot in any instance be sufficient to work any serious damage; nor is it probable that at any time would connection rivets be sheared off. This conclusion is arrived at for the reason that there is no probability that any future fire will be fiercer than the one at issue."

2nd. "The method of fastening 'fireproofing' to the underside of beams with sheet iron strips should be discarded."

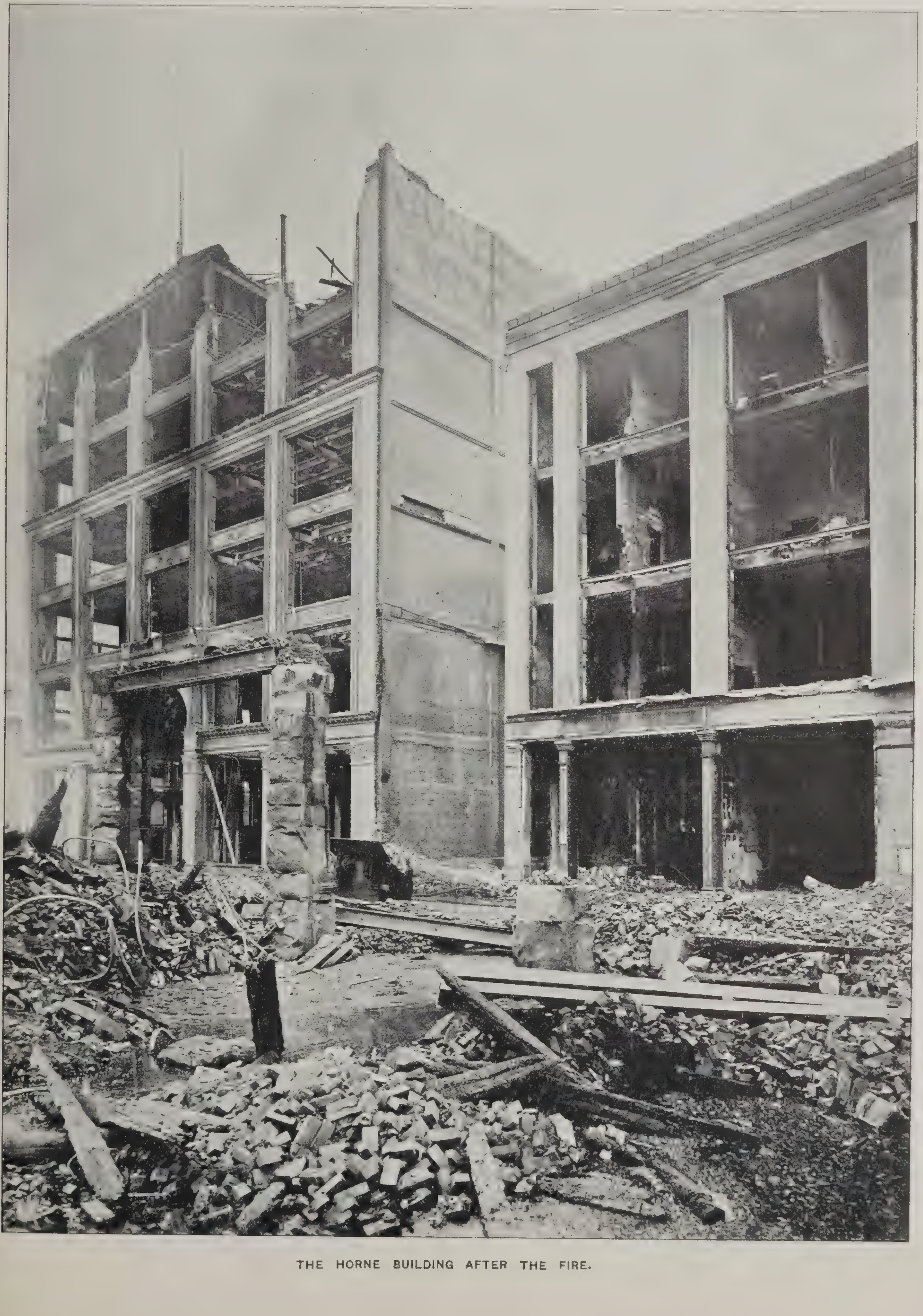
3rd. "It cannot be too often reiterated that open front buildings like this should be protected from external fires by metal shutters, and also that all shafts should be provided with metal doors which can be readily closed at all floors."

4th. "The most important lesson taught by this fire was the lack of strength developed by the fire-clay fireproofing (terra-cotta). The building was permitted to move in any direction without any material restrictions by the fireproofing. The floor arches showed by the scaling off of the lower webs that they were unable to offer any sufficient force to counteract the tendency to lateral motion."

5th. "The column protection, although composed of the very best obtainable kind of fire-clay tile, was also not of sufficient strength."

Further, the committee go on to say that:

"In our opinion it would have been necessary to dismantle the whole steel framework had this structure been fourteen or fifteen storeys high. The leaning at that height at the same proportion as developed would have entailed the necessity of taking the whole structure down. Owing to the fact that steel columns or girders or beams after being subjected to a long-continued fire will assume the same temperature as fireproofing, and owing to the fact, furthermore, that the rate of expansion of the steel is much greater than

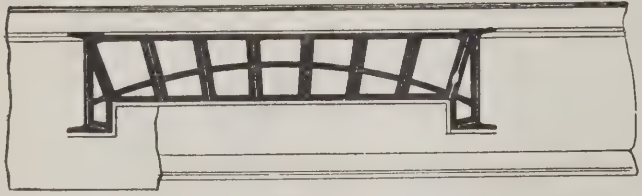


THE HORNE BUILDING AFTER THE FIRE.

that of the fire-clay tile, destructive movements are permitted which, as shown in this experience, will result in considerable damage, and which damage will increase in direct proportion to the height of the building.

"In view of these important developments, it is our opinion that important structures of this class should have a radically different method of fireproofing. The fireproofing should be in itself strong and able to resist severe shocks, and should, if possible, be able to prevent the expansion of the steelwork. There seems to be but one material which is known that could be utilized to accomplish these results, and that is first-class concrete. The fire-resisting qualities of properly-made concrete has been amply proven to be equal to, if not better than, fire-clay tile, as shown by the series of tests carried on by the building department of the city of New York.

"From the experience gained in street railway construction in laying continuous rails, it is to a large degree possible to prevent the metal from expanding. In street railway work this has been accomplished merely by the adhesion of the pavement to the side of the rails. In building construction the same results could be obtained by encasing the columns and girders with concrete placed directly against the steelwork. The adhesion of the concrete would to a large degree prevent unequal expansion of the concrete and steel. The floor arches should also be constructed of concrete, but of sufficient depth to be able to resist lateral forces. With the prevention of injurious expansion and the protection of columns with materials that can stand severe shocks of any nature whatever, the modern steel-frame constructed building would be more thoroughly protected against any fire. The construction herein suggested should not materially increase the cost of construction. The solid concrete about the columns would add strength to same, and could no doubt be made self-supporting. The same could be said of concrete surrounding beams and girders, as has been amply demonstrated by the strength developed by concrete iron constructions such as the Monier and Melan arches. One of the objections that would be raised against this construction would be that it could not be carried on in freezing weather. This is a proper objection, but there is no valid reason, in our opinion, why these structures should be built in winter any more than were the old-time brick structures.



HARD TILE FLOOR ARCH IN THE HORNE BUILDING.

"As so-called fireproof buildings are not equally and to the same degree protected against fire, we would recommend to the insurance companies that they should vary the rate of insurance for this class of building, depending upon the character of the fireproofing used. The competition between fireproofing companies has been so severe as to reduce the price of their output in very many instances at the expense of quality. The large fire loss in the Horne building would still have been larger had the fireproofing been of poor quality; and we would further recommend the insurance companies to have prepared standard specifications governing the character of the 'fireproofing' and the construction and putting up of same, and requiring owners of buildings to use 'fireproofing' subject to these specifications under careful inspection, or be subjected to higher insurance rates."

INTERNATIONAL FIRE SERVICE COUNCIL.

THE International Fire Service Council, which was constituted in 1900 and initiated the Fire Service Congress of Berlin in 1901 and Budapesth in 1904, is gradually becoming a very representative institution of the fire service and fire preventive movement in its widest sense.

As all new institutions, it has naturally met with many obstacles, which were in this case complicated by the difficulty of language and customs of the different representatives serving on this body, and also by frequent misunderstanding of its primary objects, which are (1) to serve as an enquiry office, (2) to serve as a centre for issue of statistical reports of international importance, and (3) to systematize the International Fire Congress arrangements in such a manner that there is a sequence in the subject matter under consideration. The Council is not intended for the promotion of international uniform legislation, as has been frequently erroniously stated.

The representation of some of the countries has been recently completed under the new statutes, which statutes arrange for the representation to be in proportion to the number of inhabitants within certain limitations. Thus for the first five million inhabitants of any one country (or any part thereof) there are five representatives, and for every additional five million inhabitants one additional representative, the maximum number of representatives, however, being fifteen. Under this system of representation Great Britain (exclusive of the Colonies) has twelve represenatives. These represent respectively the National Fire Brigades Union, the British Fire Prevention Committee, the Association of Professional Fire Brigade Officers, the Salvage Service, and the number includes two founders.

The last general meeting of the Council was held at Budapesth in August; the previous business meeting of the Executive at Luxemburg in February; and the current business meeting will be probably held during April. Previous to this there have been general meetings in London (1903), Berlin (1901), and executive business meetings in Paris and Brussels. We present herewith some extracts from the statutes, and we also give a list of the British representatives.

The British Representatives on the Council (12).

Representing the National Fire Brigades Union (founded 1888):—

(1) Dixon, Lieut.-Colonel, late Chief Officer, Sutton Fire Brigade; Vice-President, National Fire Brigades' Union.

(2) Seabrooke, Lieut.-Colonel, Chief Officer, Rugby Fire Brigade; Chairman of the Council of the National Fire Brigades' Union.

(3) Folker, Gen. Hon. Secretary, National Fire Brigades' Union; Hon. Chief Officer, Aldershot Fire Brigade.

Representing the British Fire Prevention Committee (founded 1897, incorporated 1899):—

(1) Sachs, Chairman, British Fire Prevention Committee; Vice-President, National Fire Brigades' Union.

(2) Marsland, Gen. Hon. Secretary, British Fire Prevention Committee; Hon. Chief Officer, Painswick Fire Brigade.

(3) Collins, Member of the Executive, British Fire Prevention Committee.

Representing the Association of Professional Fire Brigade Officers (founded 1903):—

(1) Paterson, Chief Officer, Glasgow Fire Brigade; President, Association of Professional Fire Brigade Officers.

(2) Thomas, Chief Superintendent, Liverpool Fire Brigade; Hon. Secretary, Association of Professional Fire Brigade Officers.

(3) Tozer, Chief Officer, Birmingham Fire Brigade.

Representing the Salvage Service:—

(1) Fox, Lieut.-Colonel, Chief Officer, London Salvage Corps: Vice-President, National Fire Brigades' Union.

Founders:—

(1) Dyson, Chief Officer, Windsor Fire Brigade.

(2) Kusel, Resident Delegate in Grea Britain of the Belgian, French, and Italian Fire Brigade Federations.

Extracts from the Statutes.

Objects.—The International Fire Servic Council shall be a permanent association having for its object the encouragement o progress in the organization of the means o fire extinguishing, fire prevention, the saving of life and salvage service.

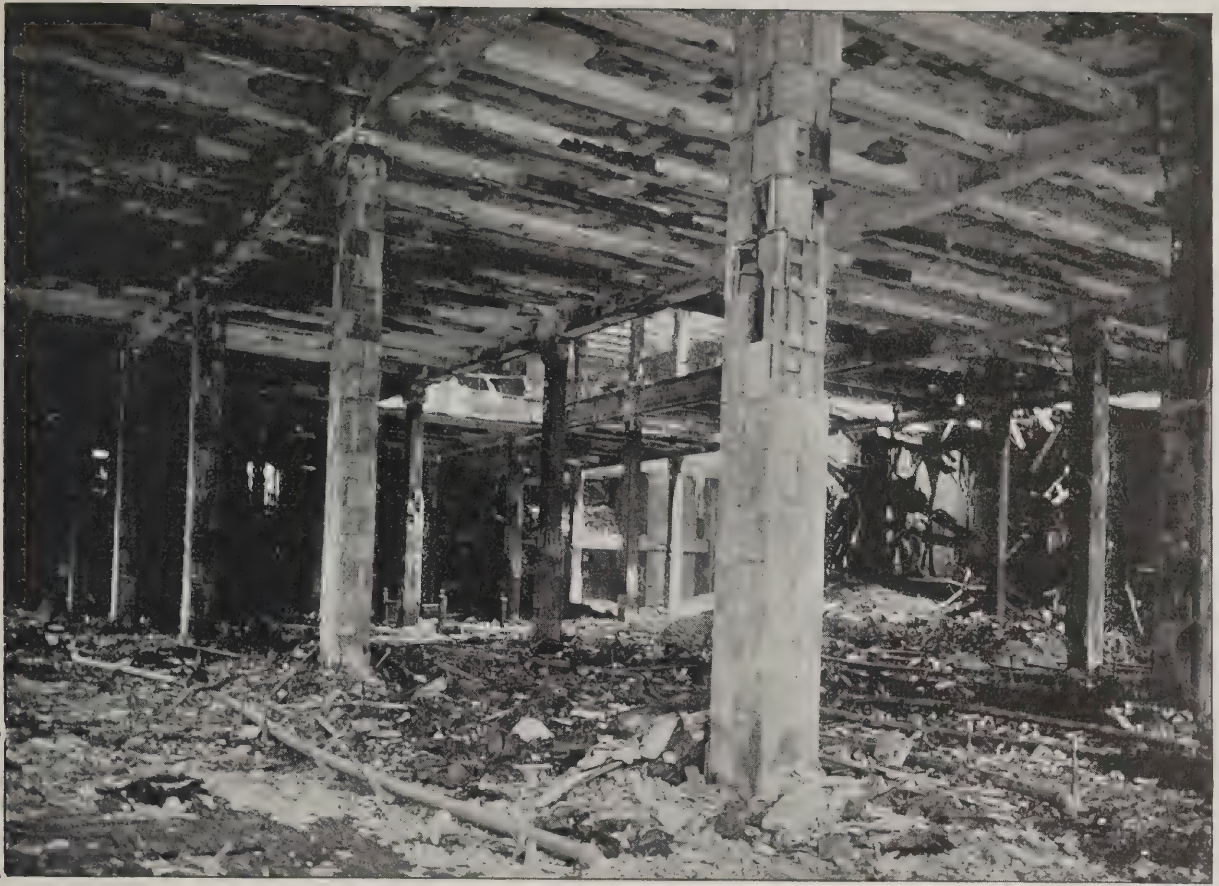
Representatives.—The Council shall comprise a number of representatives of differen countries. Every politically independen country can be represented on the Counci by members nominated by the local fir brigades' union, fire prevention societies o salvage societies; and the number of representatives shall be in proportion to the population of the country represented on th following basis: any country with a population of ten millions, according to the las census, shall have five representatives, an for every additional five millions it sha have the right to nominate a further representative; but the representatives of any on country shall never exceed fifteen. (Grea Britain is entitled to twelve representatives In cases where the representation of severa bodies belonging to any one State is proposed, the Executive alone shall decide upo the number of representatives to be accorde to each such body on the Council. Applications for membership, whether from recognized fire brigade unions, recognized fi prevention societies, or salvage societies, from individuals in their private capacit shall be addressed to the Executive, wit whom the decision as to their acceptance refusal solely rests. Members shall be electe by a majority of votes of the Executive, an membership shall not be definite until aft receipt of the necessary subscription.

Subscriptions.—The expenses of the admi istration of the Council shall be met by fund derived from the following sourc namely: Members' subscription, grants a donations. (*Note.*—Great Britain's twel representatives subscribe to the headquarte fund an aggregate of 110 francs [£4 8s.])

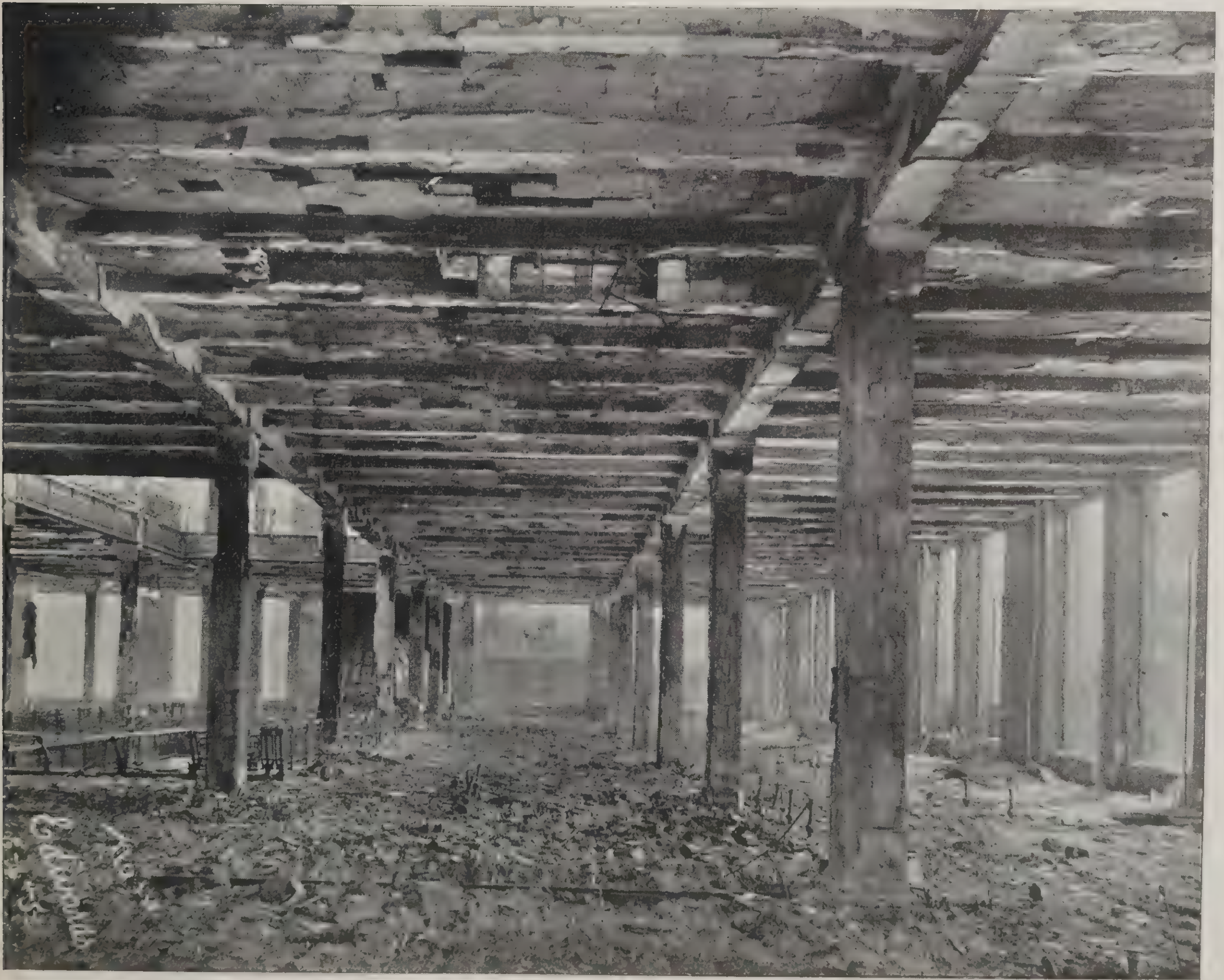
Meetings.—In the event of there being International Congress, the Council sh meet at least once in three years.

Voting.—The system of voting at a meeti of the Council shall be as follows:—Eve representative of a country shall have a vo and in the event of a representative not bei able to attend a meeting he shall have right to transfer his vote to another rep sentative of the same country, advising secretary of this, in writing, at least for eight hours before the date of the meeti Should the Executive so determine, the voti can be by correspondence.

Executive.—The Council shall be rep sented and its business conducted by Executive consisting of eleven members. T Executive shall meet at least once a ye The duties of the members of the Execut shall be honorary.



INTERIOR OF HORNE BUILDING AFTER THE FIRE, SHOWING TILE PROTECTION TO COLUMNS AND LIGHT-WELL IN CENTRE.



INTERIOR VIEW OF HORNE BUILDING.

THE ENTREPOT ROYAL, ANTWERP.

THE city of Antwerp has long been notorious for its fires, and it has had quite a number of remarkable conflagrations during the few years of the new century.

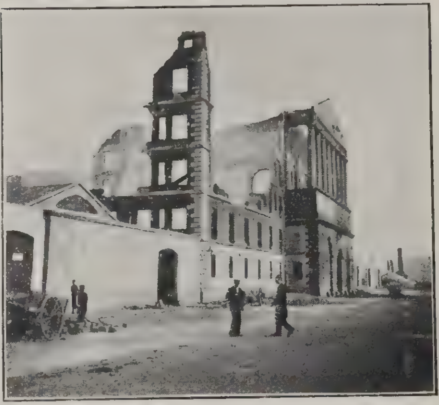
There can be no doubt that when a city has so many fires there must be something radically wrong, be it in respect to its building legislation, its fire service or its fire survey, or be it in respect to all these three departments.

Such fires as the petroleum fire in the Hoboken suburb, which we illustrated in our first "Fire Supplement," certainly need not occur, and the one which we are dealing with in this instance, namely, the Entrepôt Royal fire of 1901, could certainly have been avoided with reasonable care and management.

The premises of the Entrepôt Royal at Antwerp serve as a very interesting object-lesson for the students of fire protection in more senses than one.

In the first instance the actual fire at the Entrepôt serves as a lesson in the negative sense; further, the new Entrepôt Royal, which takes the place of the buildings destroyed by fire, serves as an example of how a thing can be done admirably to the extent of nine-tenths and then be spoilt owing to a faulty final tenth. There is not the slightest doubt that in conception and planning the new Entrepôt Royal is as excellent as the old was faulty. Everything that money and modern construction can do to make the new Entrepôt Royal fire-resisting has been done, and yet for some reason, be it that of the lack of understanding of the primary principles that should govern the precautionary measures in a warehouse of this kind, or be it merely a question of negligence or carelessness, this excellent block of buildings is still subject to considerable fire risk.

In the first place we will deal with the fire at the Entrepôt Royal, and for this purpose we will avail ourselves, of some notes by Mr. Ellis Marsland, the district surveyor for Camberwell, who visited the scene of the fire a few days after the conflagration. Regarding the new Entrepot Royal, we will utilize the facts presented by the chief officer of the local fire brigade, Mr. Scheppers, in the form of a contribution to the recent International Fire Prevention Congress of 1903, but we supplement these with some notes from the pen of an insurance engineer who recently had the opportunity of inspecting these buildings in actual working state.

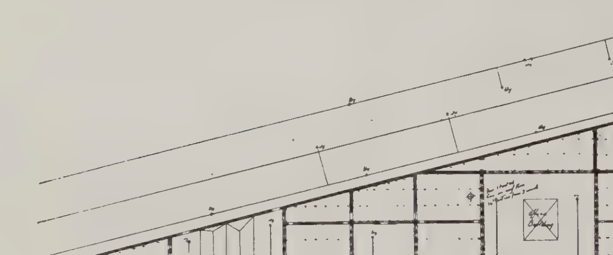


VIEW DIRECTLY AFTER THE FIRE.

We are fortunate in being able to present rough plans both of the old buildings and the new ones; we are able to present some details in both instances; and further we have been favoured with excellent photographs.

The Entrepot Royal Fire of 1901.

The Entrepôt Royal is the Government Bonded Stores at Antwerp. The warehouses, as may be seen by the plan, consisted of a series of buildings in three main blocks, each six storeys in height, fronting the Quai de l'Entrepôt, and designated the north, central and south blocks, and connected in the rear towards the Avenue du Commerce by buildings of lesser height. There were in addition a number of one-storey buildings, which are indicated by crossed diagonal lines. The buildings dated from 1830, and were erected with brick walls treated architecturally with stone, but with no claim to be of fire-resisting construction. The floors were principally of wooden joists carried upon wrought-iron girders and supported by cast-iron columns, the ends of the wrought-iron girders being let into the walls and connected on the outside by plates and washers. This accounted to a large extent for the so complete destruction of the buildings, inasmuch as the falling of the floors and ironwork dragged the walls over and brought about the total wreck referred to later on.



DETAIL OF FLOORS DESTROYED IN THE OLD ENTREPOT ROYAL.

There were cross-walls dividing the buildings up into sections, but these walls terminated below the roof, had many openings in them, imperfectly closed with badly-fitting single iron doors, and in some cases with none at all. The staircases were of wood.

The buildings were used principally for the storing of bonded goods, such as coffee, sugar, wool, tobacco, tallow, hardware and fabrics, but some of the floors were let to private tenants, and it was in one of these tenancies the fire commenced. The exact spot was on the top floor about 24 metres from the ground, indicated by the mark ø on the plan, and it spread along the roof in either direction.

The whole of these buildings, practically all communicating and adjoining and filled with most inflammable materials, were little calculated to resist the spread of fire, and in addition to this the fire starting in the roof storey, the extinguishing appliances were unable, through want of water pressure in the hydrants and lack of more powerful steam fire-engines, to touch the fire until it reached the lower storeys.

The fire occurred on June 5th at 2.30 p.m., and the brigade was called at 2.40 p.m. By 3 p.m. the fire had extended for about 2 metres towards the west, and ten minutes later had reached the eastern corner, and also in a westerly direction from the origina seat of the fire for about 40 metres. Five minutes afterwards the roof over the portion where the fire originated commenced to fal in, and by 3.25 p.m. the fire had rapidly increased and the smoke and heat were driving across the courtyard to the south wing.

At 3.30 p.m. the walls of the central block south side, began to fall, and the whole wa in flames from top to bottom.

At 4.30 p.m. the buildings of the centra and south blocks were well alight, and b 6 p.m. the whole of the roofs and floors ha fallen and were a burning ruin, which wa not extinguished for many days.

The only portion saved was the nort block. The northerly breeze which wa blowing assisted the efforts of the brigade i preventing the flames leaping across th courtyard, although in the other direction greatly helped in spreading the fire.

The New Entrepot Royal.

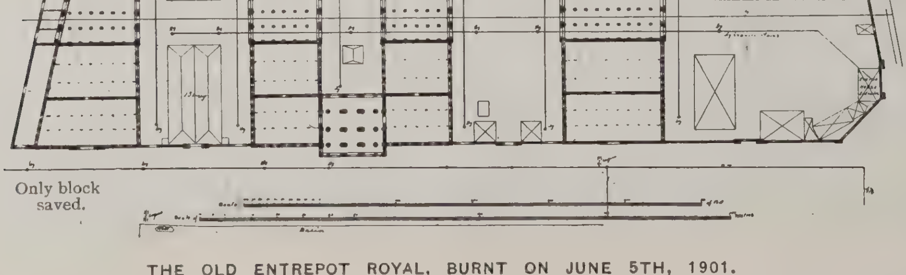
The following are the particulars of th new Entrepôt Royal and the principles th guided its erection, as recently presented b Chief Officer Scheppers as a contribution the Congress referred to.

It was decided to make the rebuilding the Entrepôt the occasion for a competiti in accordance with a set of conditions, which those clauses which specially intere us are as follows :—

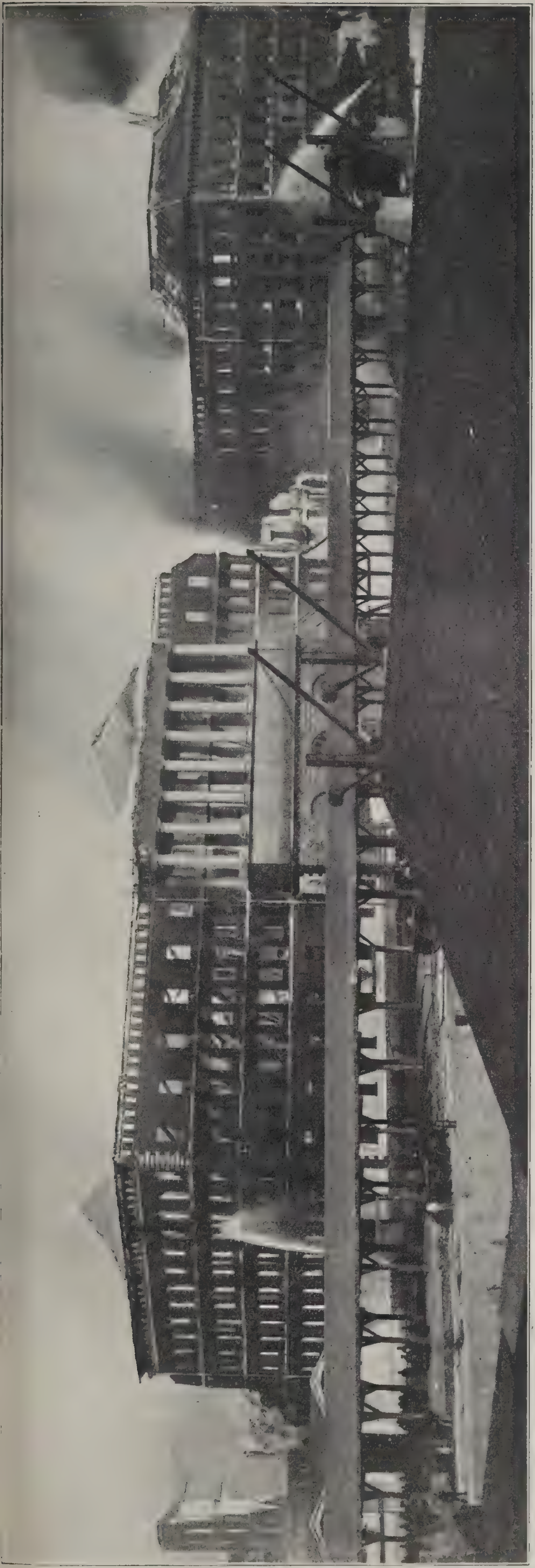
"The buildings shall be entirely construct of incombustible materials, such as bric concrete and metal. They shall be design from the point of view of the spread of fi and therefore divided into compartments n communicating one with another. T staircases giving access theteto shall outside, at any rate from the first stor upwards; lift wells to be capable of bei closed by metal doors Balconies projecti about 4½ft. shall be fixed at the level of ea storey, and shall run the whole length of t side next the courtyards.

"The widow frames shall be of metal concrete, the glazing in wired Bohemi glass as per sample deposited at the to hall. The frames shall be fixed, but sh have ventilating openings so arranged th they can be easily stopped externally in c of fire.

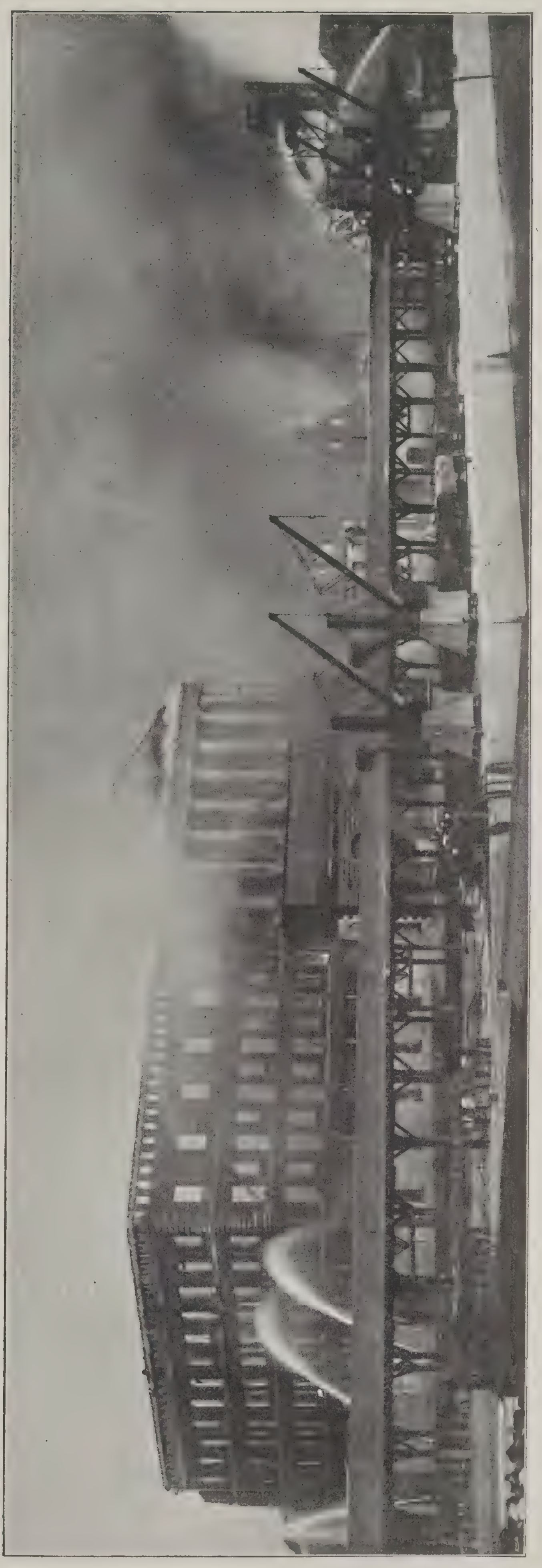
"Arrangements shall be made for draini off water from each compartment of warehouse so as to limit damage. The flo shall have a slight slope.



THE OLD ENTREPOT ROYAL, BURNT ON JUNE 5TH, 1901.



VIEW SHOWING THE FIRE AT THE ENTREPOT ROYAL, "ANTWERP, AT 6 P.M. ON JUNE 5TH, 1901.



VIEW SHOWING THE FIRE AT THE MOMENT OF THE FALL OF THE WEST FRONT OF THE SOUTH WING.

VIEWS OF THE NEW ENTREPOT ROYAL, ANTWERP.

"The contractor shall so arrange that it may be possible, without pulling down any part, to erect on each block a structure carrying a reservoir of 100 cubic metres capacity.

"The roof shall be flat, sloping slightly towards the outside walls, and shall be formed of a waterproof covering of tarred felt or cement on wood under a 6in. layer of Rhine gravel.

"The front and party-walls shall be carried above the roof and protected by stone or other incombustible material."

In this clause, it will be noticed, it is not laid down that armoured concrete shall be employed, for, although numerous experiments have proved its great resistance to fire, everyone was not agreed as to its stolidity. In other words, the formula for calculating the strength of armoured concrete beams had not then been definitely fixed.

The following clause set out the loads to which the different floors were to be submitted:—

"The loads to be carried by the floors shall be 2,000 kilogrammes per sq. metre (about 2 tons per sq. yd.) for the ground, first, second, third and fourth floors, and 1,000 kilogrammes for the fifth floor and the attic of the large shed. The contractor must provide at his own cost these floors and columns capable of supporting loads one and a half times superior to those estimated; they must accord with the plans and have a span not less than one-tenth of the whole span, and the trials shall be made simultaneously at all the storeys, the portions loaded being vertically superposed."

As was to be expected, all the competitors submitted plans in armoured concrete. After careful examination, the plans of Messrs. Bolsée & Hargot were adopted. At the same time, in deference to the views expressed by the Chamber of Commerce, a storey was suppressed as well as the sheds connecting the different blocks.

The reconstructed buildings comprise—

(1) Three large blocks (ground floor and four storeys), which, with the northern block which escaped the fire, formed the Entrepôt. (2) The store called La Plata (ground floor and three storeys) and the adjoining large shed (ground floor and one storey).

The façades and dividing walls have been carried out in brick and cement-mortar. The ceilings, columns and terraces are of protected cement on the Hennebique system. The tests carried out according to the specifications proved the great resistance of the materials.

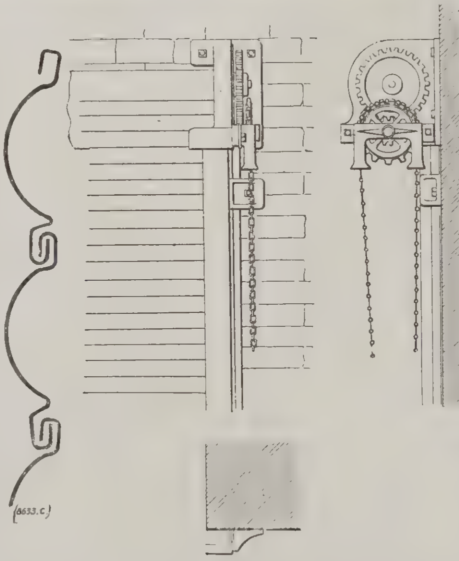
All the glazing is in Bohemian wire glass. There can be no question of fixing the glazing directly in the protected cement, as space must be given for the play of expansion. At the Antwerp Entrepôt the glazing is held in frames of the Fabry pattern, which allow for this expansion while offering great resistance to fire, as the recent tests at Brussels have demonstrated.

Each block is divided into several compartments independently of each other, and acces is obtained thereto by doors leading to gallery 4ft. 8ins. broad running the length o the lateral façade.

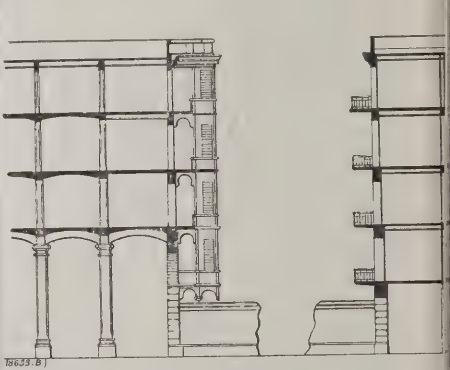
The stairs are likewise isolated, and afte the first storey they are enclosed in projection or exterior stairways.

In every other respect the conditions lai down in the specification quoted above hav been observed.

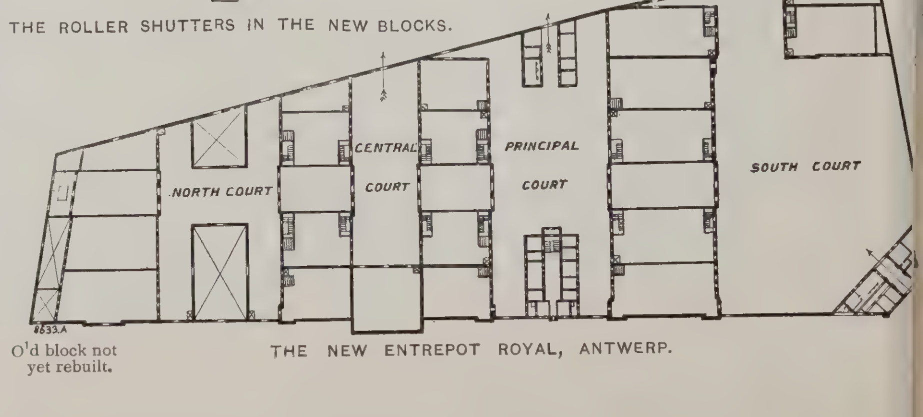
All the iron swing doors provided for i the scheme have been replaced by meta doors on the Kinnear system. They ar formed of sheets of steel so arranged tha there is free play for any expansion to whic they may be subjected in any direction. B the employment of these doors space is gaine as they work around a steel beam fixe above the bays. The working by means of a endless chain and the system of padlockin



THE ROLLER SHUTTERS IN THE NEW BLOCKS.

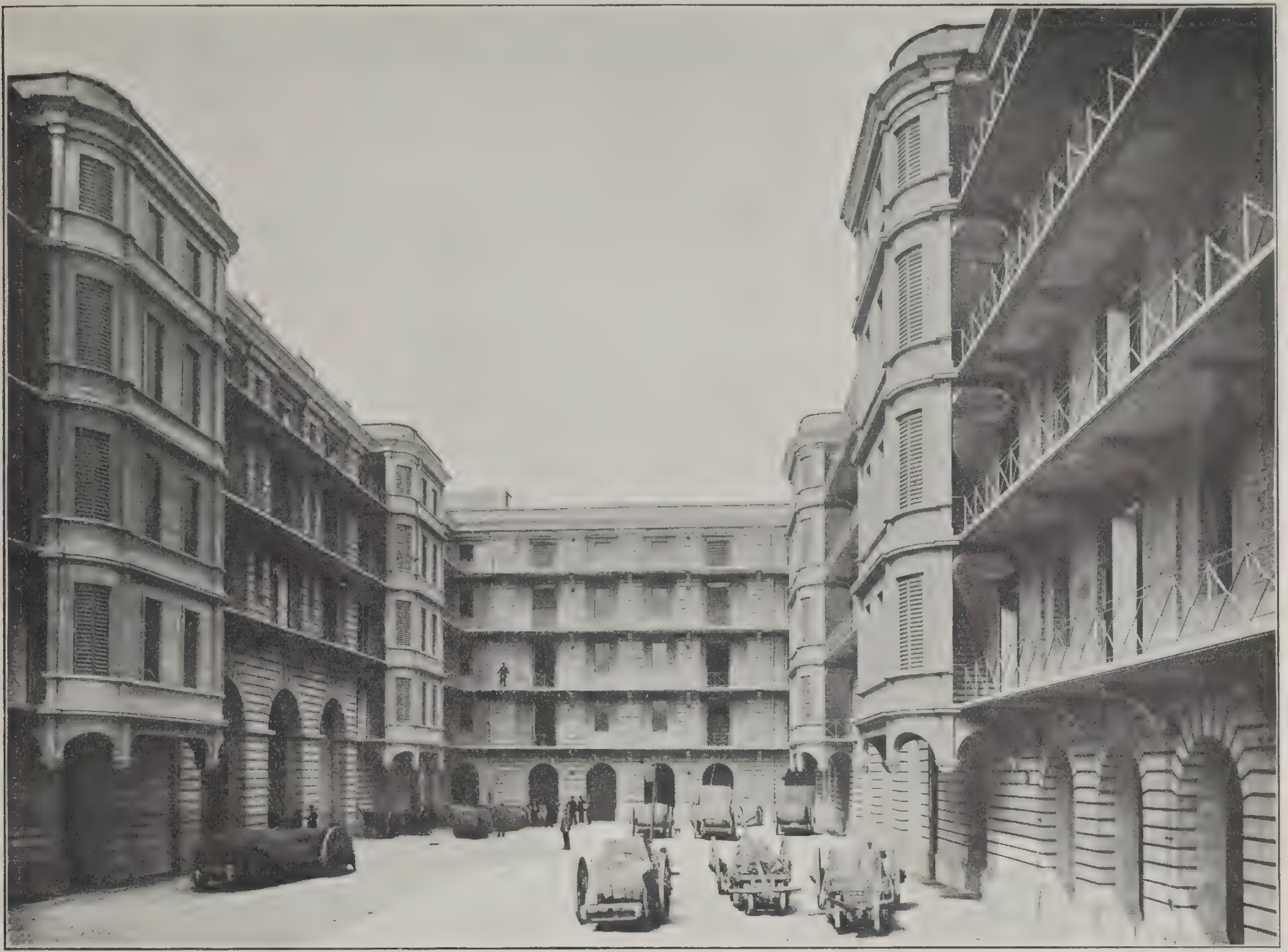


SECTION SHOWING OUTSIDE GALLERIES IN THE NEW BLOCKS.



O'd block not yet rebuilt.

THE NEW ENTREPOT ROYAL, ANTWERP.



THE NEW ENTREPOT ROYAL, ANTWERP: THE CENTRAL COURT.

s most simple. Finally, the tests proved hat these doors offer a good resistance to re, and work as well after the fire as efore.

The Entrepôt is served by fourteen electric ifts, eight of which have a capacity of ,000 kilogs. and six of 600 kilogs. and four ranes attached to the façades. The lift vells are placed against the dividing walls n such a manner that each lift communiates by means of its doors with two adjoinng compartments.

Two electric cables are carried up through he lift well to a space on the roof built in vith armoured concrete in which the motor as been located. The latter is worked by ne of these cables, while the other cable ommunicates with the different doors. On eaching a landing the lift itself unlocks the oors and allows them to be opened. At the ame time this system prevents the opening f more than one door at a time; further, is necessary to shut each door before the ft will move.

A last detail. In spite of the fact that one torey and the connecting sheds between the arious blocks have been abolished, it is ossible, thanks to the solidity of the floors, store twenty-one million kilogrammes about 19,260 tons) more goods.

vailable surface of warehouses :—

Old buildings	-	45,500 sq. metres.
New buildings	-	39,000 ,, ,,

otal weight to be stored :—

Old buildings	-	57,000,000 kilogs.
New buildings	-	78,000,000 ,,

A Criticism of the new Building.

Reading this description, it might be ssumed that perfection had been nearly eached.

Perfection had as a matter of fact been very nearly reached, but for the neglect of certain points which are more than remarkable, and remind us of the notorious three large holes in the surrounding walls of the Antwerp ferro-concrete petroleum enclosure, which were left practically to invite the entrance or exit of burning oil, and referred to when speaking of the Antwerp petroleum fire.

We are presenting an insurance surveyor's comment on these faulty points, and trust that in the event of their reaching the right hands a remedy may be found before it is too late.

Our informant writes that the idea upon which the foregoing arrangements are based, at the Entrepôt Royal, if perfectly carried through, would be excellent, and with provision for the early discovery of an outbreak of fire, and the prompt attendance of a well-organized fire service with suitable extinguishing appliances, a serious spread of fire should be prevented. The ultimate value of all fire-resisting buildings is, however, only that of their weakest part; it may, therefore, be instructive to remark some weak points that were observed.

The floors, beams, columns, enclosures to staircases and the balconies as indicated are of reinforced concrete. From the scantling and form of some of these members, it is, however, to be feared that the thickness of concrete in front of the metal reinforcing rods is not sufficient to prevent continued heat seriously weakening their tensile resistance.

Lifts pass through all floors of several of the compartments enclosed with thin incombustible partitions, which have lofty door openings provided with light iron doors of poor construction which did not close properly. A spread of fire by means of these doors is practically a certainty. In addition, openings about 9ins. diameter occurring in the concrete floors had been left. For what purpose these openings were formed is not apparent. They would allow of the rapid spread of fire, and lead to much damage by water.

The sub-division of the vaults, in which tallow and vegetable oils are stored, is stated to follow that of the compartments over, but openings are believed to exist in some of these division walls.

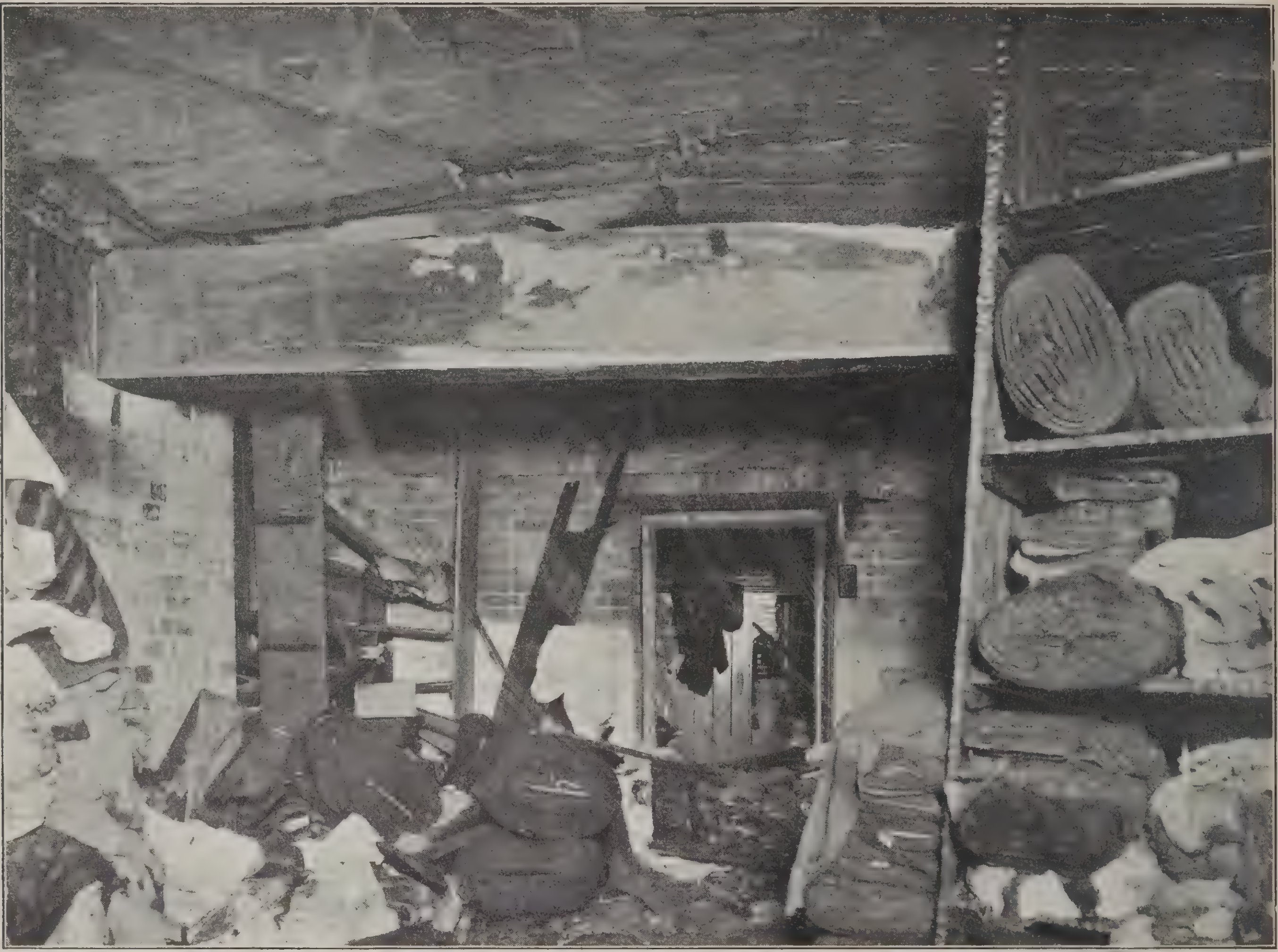
The use of compartments for goods of a similar character only is not observed, and very little attention appears to be given to a classification of the goods stored.

One old block which had not been destroyed in the fire of 1901 has not yet been rebuilt, and thus is a menace to the Entrepôt.

We think these criticisms should not be overlooked. We would add some of our own, namely, our opinion that the aggregate of the concrete used may not be as suitable for fire-resisting purposes as anticipated; that there did not seem to be sufficient first-aid appliances to meet a small outbreak, and that there was no system of fire patrol as we understand it.

Particulars of Fires.

Authentic technical particulars dealing with fires are invited from readers, more particularly where they deal with structural points of interest or questions of the efficacy or inefficiency of any special forms of structural work. Contributions should be marked "Fire Supplement" and addressed to the Editor, BUILDERS' JOURNAL, 6, Great New Street, E.C.



VIEW IN THE BASEMENT OF SHOP IN COSMO BUILDINGS, SOUTHAMPTON ROW, LONDON.

"BLOOMSBURY GAS EXPLOSION."

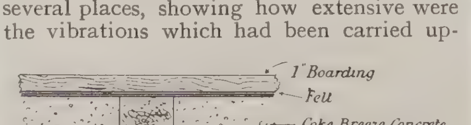
WE published on p. 29 of our "Fire Supplement" dated December 21st last an account of the explosion of gas which occurred about 2 o'clock in the afternoon of December 14th in the basement of the shop occupied by Mr. Barber, draper, which is at the corner of Cosmo Place, Southampton Row, W.C., in the extensive block of buildings known as Cranston's Waverley Hotel. This explosion was of a very violent character, causing considerable damage to the buildings in the vicinity and injury to a number of people engaged in the buildings and neighbourhood.

The glasswork to this building, and to others around, suffered very greatly, and the pavement of flags 4ins. thick around Mr. Barber's shop was broken up, and the fragments hurled in all directions; the flagstaff at the top of the hotel was brought down, and many incidents took place which bear testimony to the remarkable force of the explosion.

The ground floor of the shop, which received the full force of the explosion beneath, was constructed of Granolithic concrete; this rested upon the upper flanges of the steel joists and walls which formed bearings. These joists are in this particular floor about 8ft. apart, and the thickness of Granolithic is 3½ins. The rolled joists were not encased in Granolithic, but were treated with metal lathing and plaster in the usual way. The Granolithic slabs measure about 18ft. by 8ft., and have a mesh of round steel tension-rods near the soffit, these rods forming a mesh of about 4ins. by 3ins. The work was laid about June, 1899.

The photographs show what took place. The force of the explosion caused an upheaval of the whole of the shop floor, causing it to assume an arched form, the arch extending from wall to wall and having a span of about 17ft. with a rise of about 10ins. The tenacity and soundness of the material is well attested by the arch shape assumed by the floor and the absence of rents or open cracks in the concrete composing it. The Granolithic has been drawn away from the walls of the room, but has nowhere—as in the case of the heavy skylights and flagging over the areas round the shop—been blown right away from its initial position.

With reference to the floor at the first-floor level, which is above the shop, and forms the floor of the ladies' drawing-room, &c., in the hotel, the Granolithic floor has not left the joists, and upon examination no noteworthy defects were observed. These Granolithic slabs are about 18ft. by 11ft., resting upon the upper flanges of 14in. by 6in. steel joists, and wall bearings; their thickness is 4¼in., and they support light partition walls which are built thereon. These latter walls, between first- and second-floor levels, were found to be cracked in several places, showing how extensive were the vibrations which had been carried upwards through the building. The first-floor Granolithic slabs have a mesh of round steel rods at their underside, measuring about 2½ins. by 3½ins., the formation of the floor being according to the sketch here reproduced.



SECTION OF GRANOLITHIC FLOORS AT FIRST-FLOOR LEVEL.

We are of the opinion that the behaviour of the ground floor of the shop has to a large extent prevented a very disastrous result to a considerable portion of the building.

Messrs. Stuart's Granolithic Stone Co., Ltd., were the specialist contractors for the floors.

AN AMERICAN SOCIETY OF BUILDING COMMISSIONERS.

A SOCIETY called the International Society of State and Municipal Building Commissioners has been constituted recently in the United States at the instance of Mr. F. W. Fitzpatrick, consulting architect, of Washington. Its primary object is to seriously take up the question of fire prevention and to popularize that subject among the municipal officials entrusted with the control of buildings. The title is somewhat unnecessarily elaborate, and we believe the term "International" only refers to the two American continents—in fact, only to the North American Continent, *i.e.*, to the United States and Canada. But the object of the society is an excellent one, and, if carefully managed as an institution which desires practical as distinct from theoretical remedies should do considerable good. There is certainly ample room for improvement in the United States, a country which bristles with marvellously-conceived building Acts and regulations of a highly complicated character, generally ignored in a wholesale ıanner by all concerned. The first executive f the new society is as follows:—Mr. James Iulcahy, of Boston, president; Mr. G. U. Ieimburger, of St. Louis, first vice-president; Ir. Henry Rumrill, jr., of Buffalo, second ice-president; Mr. F. A. Pittman, of Atlanta, hird vice-president; Mr. James G. Houghton, f Minneapolis, fourth vice-president; Mr. Robert McCallum, of Toronto, fifth vice-ıresident; Mr. Alcide Chaussée, of Montreal, ixth vice-president; Mr. F. W. Fitzpatrick, of Vashington, D.C., secretary-treasurer; with Ir. F. L. Brown, of Scranton, Mr. F. H. llerbe, of St. Paul, and Mr. C. B. Cooke, of Wheeling, W. Va., as members of the xecutive committee.

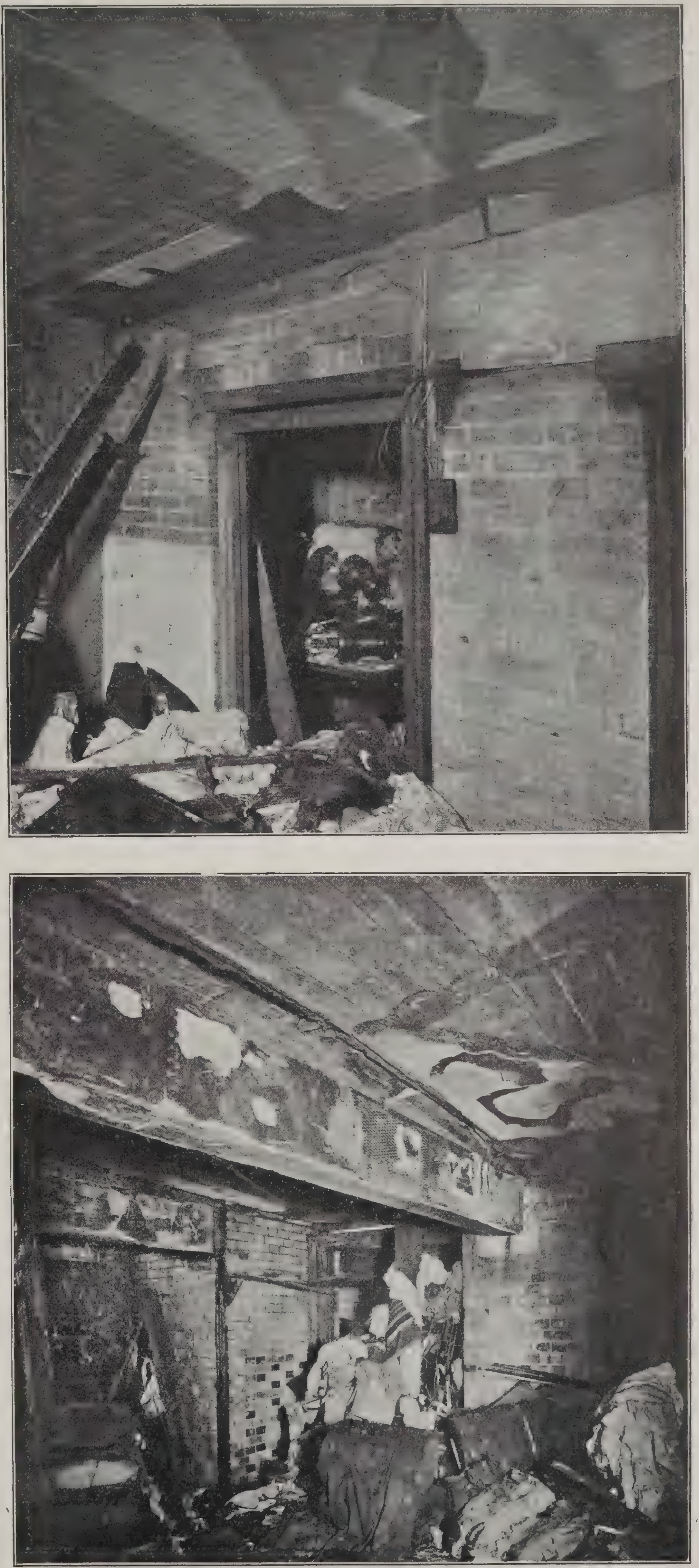
The objects of the society are closely lefined in section 2 of article 1 of its con-titution, which is as follows:—

The purposes for which this society is organized are to secure a closer official and ersonal relationship between the repre-sentatives of the building departments at ıome and abroad; to secure more uniform uilding laws in all the cities; to collect from every source information relating to building matters, tests, &c., and the dis-semination of that information among those forming part of this society; concerted action toward the advancement of the sciences of construction; and particularly the adoption by the States and municipalities of means to secure as far as practicable the prevention of loss of life and property by fire.

FIRES IN 1904.

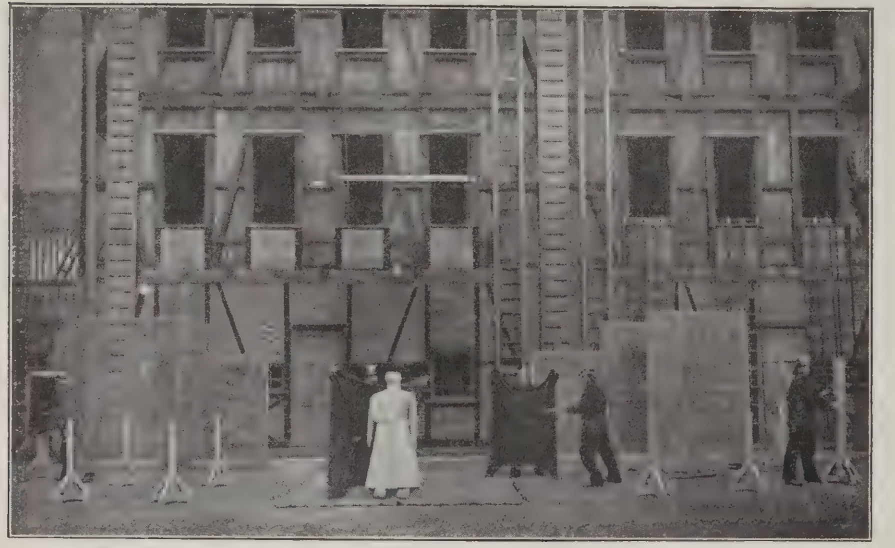
THE "Post Magazine" summary of January 7th gives the following particulars as to notable fires and fire losses during the year 1904:—

	£
Fraser's Bleach Works, Cullybackey	11,000
McCurdy's Bleach Works, Belfast	10,700
Miller & Co., Dyers, Cambuslang	7,000
Gale Calico Printing Works, Littleborough	13,000
Yarn Dye Works, Newton Heath	10,000
Rodgers (drapers), Windsor	15,000
Drapers in High Street, West Sunderland	18,000
Dailuaine & Talisker's Distilleries, Aberdeen	100,000
Worsted Mill, Keighley	40,000
Soap Factory, Aberdeen	25,000
Old Mill, Lowestoft	40,000
Silk Mills, at Halifax	50,000
Warehouse, Haydon Square, London	200,000
Golden Lane fire, London	40,000
Fountain Street fire, Manchester	60,000
Portland Street, Manchester	30,000
Hull Warehouse	27,000
Liverpool Cold Storage	12,000
COUNTRY PLACES.	
Knepp Castle	60,000
Davenham	20,000
Blansdon Abbey	25,000
Ellingham Hall	7,500
New Biggin Hall	12,000
Hengar, St. Judy	25,000
Westbury Park	20,000
Poltalloch House	30,000
Enville Hall	26,000



EFFECTS OF THE GAS EXPLOSION IN SOUTHAMPTON ROW ON DECEMBER 14TH, 1904.

Dummy cloth rack. Dummy Wings. Dummy Artist. Dummy Wings. Dummy Hydrant.



"THEATRE FIRE WATCH" DRILLING AT BERLIN.

As to the lessons of this fire, we do not think that there are so very many to be learnt in this country. To our mind, practically everything that was neglected at Chicago is already well provided for in London, and is gradually being provided for in the provinces. Only in one particular would we advocate yet greater stringency than set out in the Lord Chamberlain's new regulations for theatre safety, and the new conditions of licences issued by the London County Council. We refer to the non-inflammability of stage scenery. We consider that such scenery should be absolutely flame-proof, both as regards the canvas material and the wood battens or profile board of which it is constituted. The mere makeshift of painting should not be permissible; impregnation to our mind is essential. We are fully aware that the impregnation of existing stocks of scenery would be a great hardship on the managements, and for this reason we advocate that such impregnation stocks should be spread over a period of one or two years, or even more where large stocks have to be dealt with; but all new scenery should *ipso facto* be thoroughly impregnated. We are convinced that this is no financial hardship to theatre management, because (1) proper machine-made impregnated scenery can be turned out cheaper than scenery made on the stage by carpenters without machinery and out of unimpregnated materials, (2) because impregnated scenery carries with it a reduction of insurance premium if thoroughly and reliably carried out.

Thus we believe that the regulations referred to regarding non-inflammable scenery require strengthening, and administrating in the most energetic manner, for in the majority of cases the secret of fire protection in the theatre rests in the non-burnability of the stage and its appurtenances.

THE CHICAGO THEATRE FIRE.

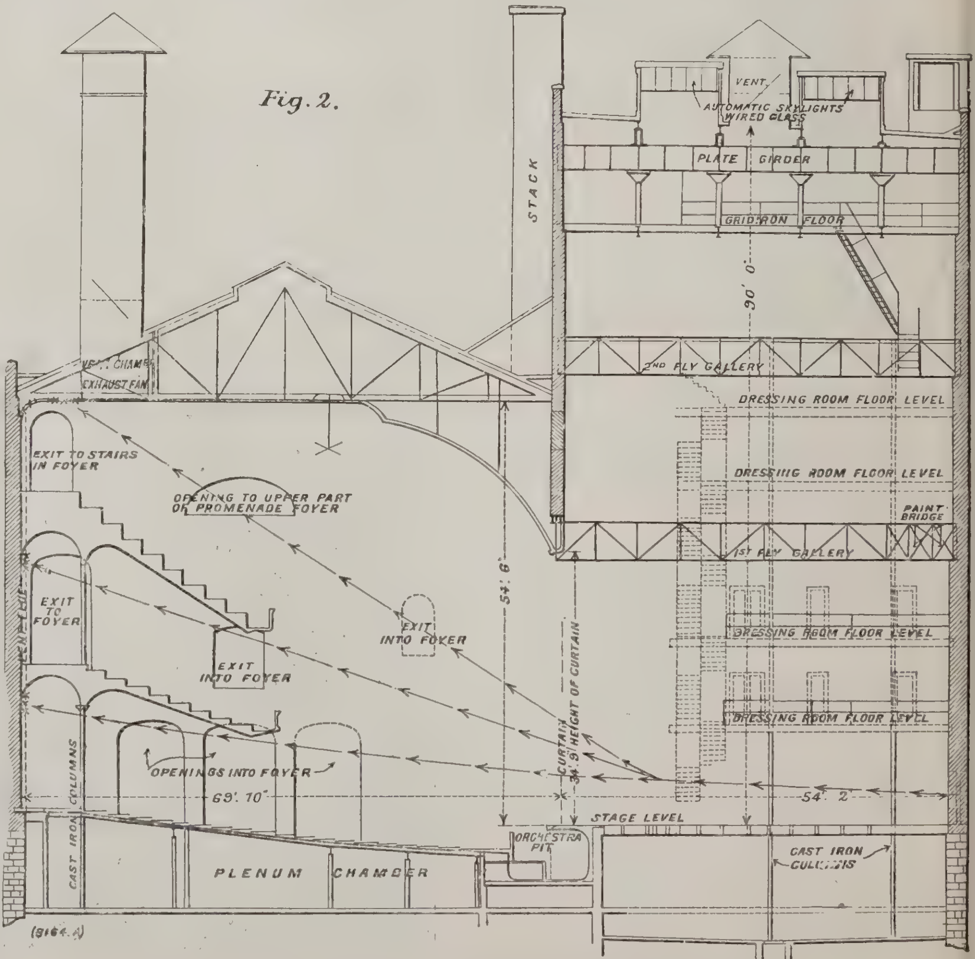
THE remarkable news reaches us from America that although the coroner's jury which investigated the causes of the catastrophe at the Iroquois Theatre, Chicago, severely condemned the theatre manager, numerous public officials and theatre employees for their neglect, all these persons will in no way suffer for the terrible results of their failings: in other words, there will be no punishment for that sad combination of ignorance and corruption which caused the terrible loss of life December, 1903. Further, we understand that performances are being given at the theatre, which has been little altered since the catastrophe.

If we dispassionately examine the long list of accidents occurring in the United States, be they railway accidents, street accidents or such disasters as that of the excursion steamer the "General Slocum," we are everywhere met with the fact that as a rule the loss of life is solely due to owners' wilful neglect of ordinary safeguards, together with corruption of public officials. This is no doubt a sweeping statement to make, but we regret to say we are convinced of its absolute truth; and the Chicago fire is only one of many instances where such neglect and corruption remain unpunished. Our American cousins are not behind us in the drafting of rules and regulations; the excellence of their building construction is well known; but all such advantages as they may thus possess are entirely discounted by the wilful neglect and corruption referred to.

We will not enter further into the natural conclusions any thinking person must arrive at regarding the much vaunted civilization and advance of the American nation, when such neglect and corruption are features of American public life.

We take the opportunity also of presenting, by way of reminder, a plan and section of the ill-fated theatre, so that the execrable planning of the building may not be too soon forgotten.

Fig. 2.



SECTIONAL VIEW.—ARROWS SHOW DIRECTION OF AIR CURRENTS.
IRCQUOIS THEATRE FIRE, CHICAGO.

ERLIN'S THEATRE "FIRE WATCH."

T is a matter not generally appreciated that ever since the early 'sixties the oyal Police Fire Brigade of Berlin has done e duty of "fire watches" in the theatres the Prussian capital. It is not our purpose here comment upon the advantages or sadvantages of the "fire watch" in a eatre being manned by firemen from the cal professional brigade. There are cer- inly very distinct advantages, but at the me time there are disadvantages. Thus e responsibility of the management de- eases in ratio to the increase of responsi- lity taken over by the public authorities putting "fire watches" into theatres.

Further, a system that would be eminently plicable in one country is not necessarily ually applicable in another, and thus what recognized as an essential in Berlin is not cessarily either essential or politic in ondon.

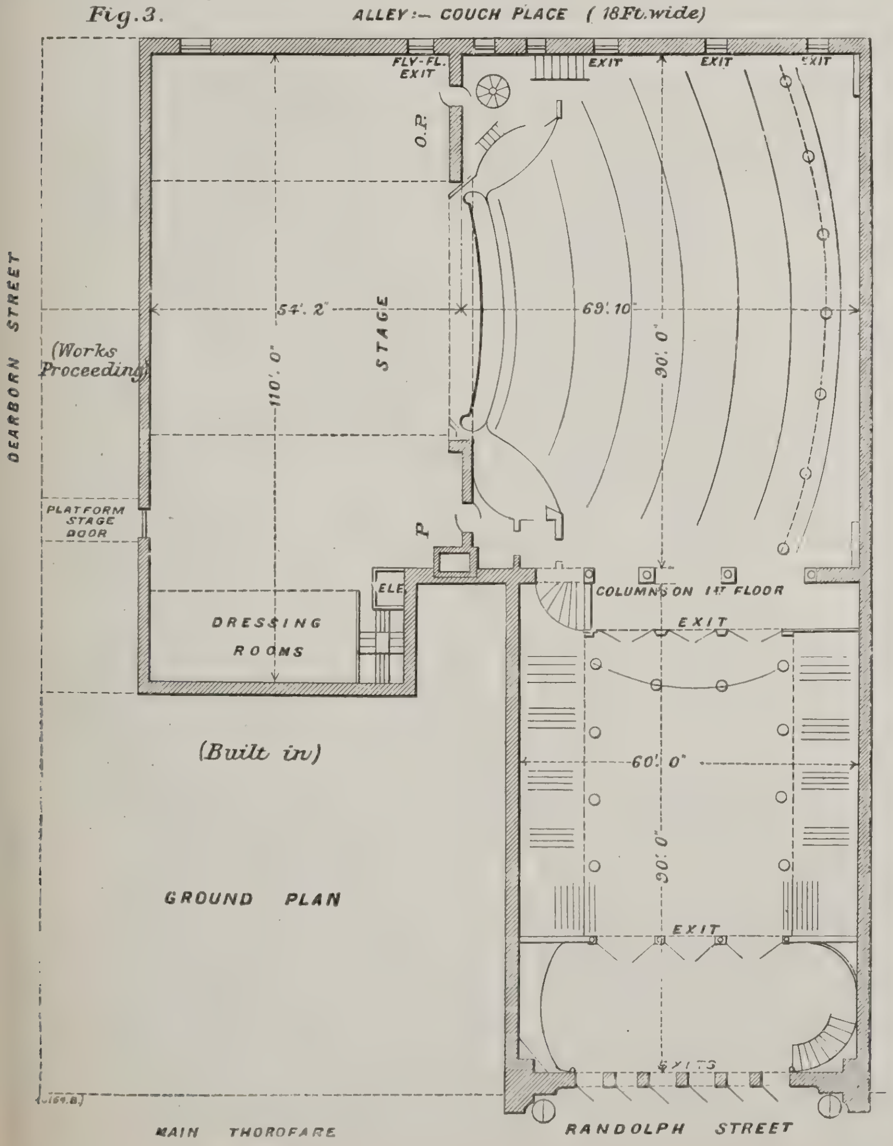
The fact remains, however, that as far ack as the 'sixties it was the recognized ing for the "fire watch" in every theatre be manned by professional firemen, and at during the last forty years this system as been gradually developed in such a way at we to-day find that the Berlin Fire rigade has an entire company of firemen, nown as the 6th Company, which com- any has been specially formed to take over fire watch" duty in places of public enter- ainment. This company, which is of con- derable strength and is in the special charge f two superior officers, is systematically ained to theatre work. So that the men hall not become rusty in their general fire practice, the men are transferred to and removed from this company at intervals, and the company also affords certain "reliefs" for the ordinary duty men during certain hours of the days—such as the dinner hour—so that the men keep their hands well in for the ordinary routine work and ordinary fire work although belonging to the special theatre section. The total strength of the theatre company comprises twelve foremen and fifty seven firemen. The "individual watches" vary in strength from one to twelve, the latter strength being at the Royal Opera House, a building requiring exceptional precautions.

Great efforts are made to keep the men on "fire watch" in good physical condition, and thus they are drilled daily and also have to do gymnasium work daily. The Berlin brigade suffers considerably from the tendency of its older and more experienced men to run to fat, and this necessarily requires very energetic handling. The special drills comprise a drill with cloths for wrapping up a human being whose clothes have caught fire, bucket drill, hydrant drill, iron-curtain drill, ventilation "flaps," "sprinkler" and fire-alarm drills, life-line work.

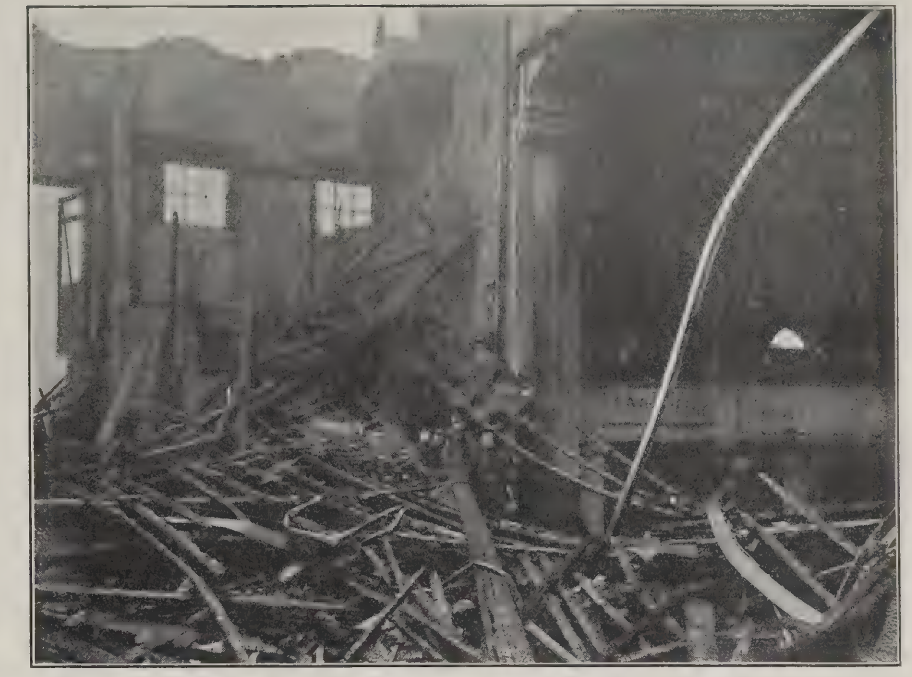
The illustrations which we reproduce are snapshots taken during a drill at the headquarters fire station; a dummy doll is being used, there are dummy wings, a hydrant, &c., and we see two men getting to work with cloths and two men setting to work with hydrants.

We believe this illustration is quite unique in the annals of theatre protection, and it may serve as a basis for the further development of the subject of "fire watches"—be they private or professional—in our theatres.

Fig.3.



GROUND PLAN OF IROQUOIS THEATRE, CHICAGO.



STAGE SIDE OF THE CROUCH END OPERA HOUSE.

CROUCH END OPERA HOUSE FIRE.

WE present a photograph of the stage of the Crouch End Opera House, which was destroyed by fire on Christmas Eve last, after rehearsal.

The entire stage portion was gutted, but a considerable portion of the front of the house remains intact.

We hope to be able to refer to some technical features in this fire at a later date, more particularly on the protection of the proscenium opening.

In the meantime we would, however, mention that the fire-resisting curtain which existed at this theatre was apparently not an asbestos cloth curtain, but a curtain of two thicknesses of canvas painted with a coat of asbestos paint, and the manner in which it was hung and the way in which the runners were fixed did not accord with the usual practice in the London County Council area.

THE FIRE AT THE EAST INDIA DOCKS.

THE EAST INDIA DOCK FIRE.

WE present a photograph of one of the bays of the East India Docks which will give some idea of the character of the buildings involved in the recent fire at these docks.

There is nothing of structural importance that claims recording in this fire.

It will be seen that for all practical purposes we have to deal with a fire that was in buildings of the dock shed class, filled with a considerable assortment of inflammable goods.

NEW FIRE TESTING STATIONS IN THE UNITED STATES.

PROFESSOR WOOLSON, of the Columbian University, New York State, who visited London on the occasion of the International Fire Congress of 1903, and particularly looked into the work of the British Fire Prevention Committee's testing sation at Porchester Road, besides recently issuing a valuable book upon the work of the Congress and the work of the testing station, has now organized a testing station on lines not dissimilar to those of the one in our metropolis, with, however, the rather curious exception that gas is not being made use of to assist in the application of heat and flame.

The testing station, which is known as the Columbia Fire Testing Station of the Columbia University, New York City, has the personal supervision of Professor Woolson, who is assisted by the students of the Mechanical Department of the University, and further has the co-operation of the City Building Bureau of New York.

The reports are got up very much on the same lines as those of the British Fire Prevention Committee, and are well illustrated by photographs and diagrams.

Tests, based on the London practice, have also recently been organized by the Boston Mutual Experiment Station at Boston, U.S.A., under the supervision of officers of the Mutual Factory Insurance Association, whose president, Mr. Edward Atkinson, visited London some years back and reported in considerable detail on the British Fire Prevention Committee's work, and afterwards also sent the vice-president, Mr. Gray, to be present at some investigations on this side of the Atlantic.

Owing to the standardization of tests arrived at by the British Committee at the International Fire Congress of 1903, it may be anticipated that in the course of the next few years' tests in most countries will be on identical lines, so that a test undertaken in any one country can be compared with that undertaken in another. If all these reports could be issued on exactly identical lines and even in the same style as the London ones, it would certainly be a great advantage to architects and builders and a matter of considerable economy for the owners of proprietary systems who are trading in several countries.

IMPENDING OFFICIAL FIRE TESTS.

WE understand that official fire tests will be conducted by the British Fire Prevention Committee this Wednesday afternoon, January 18th, with three electro-glazed casements of the British Luxfer Prism Co., of London, and with a partition of slabs 2½in. thick, erected by the Adamant Co., of Birmingham and London.

It is interesting to observe that the British Luxfer Prism Co. has already been up for investigation several years back, when they twice underwent the ordeal of tests with large casements and once with large skylights. This time the superficial area of a panel of electro-glazing is 4ft., in accordance with the recent official requirements. This is thus the fourth official test with this Company's glazing.

We understand that among the tests in hand is an important test of a concrete floor in which a set of broad flange girders are to be used, which are being provided by Messrs. Skelton & Co., who have specialized in this class of girder.

We also understand that an automatic Fire Alarm System is to be under test in February. This system is being put forward by a Danish firm, the Autopyrophon Co., of Copenhagen.

There will apparently also be some further door tests with varieties of hardwood doors during the Committee's present session.

The German Association of Professional Fire Chiefs has issued an elaborate report of its tests with so-called patent fire extinguishers and the like. This report, although of a very matter-of-fact character, has made a great sensation throughout Germany, and will probably eventually kill the present German trade in patent extinguishing mixtures, &c.

RECENT FIRE TEST REPORTS.

A Lamp.

THE British Fire Prevention Committee has issued two reports which are somewhat outside its regular routine, which up to the present has been mainly devoted to the testing of floors, partitions, doors and other structural work. The two reports issued dealt with a sprinkler, and a petroleum vapour lamp.

Regarding the petroleum vapour lamp (by Messrs. Petrolite, Ltd.), it is obvious from the report that its factor of safety is a very high one, but we observe that Mr. Ellis Marsland in a prefatory note particularly calls attention to the fact that the lamp tests refer to lamps filled and in actual use, and do not refer to the question of filling. In an appendix it is shown how the makers recommend that these lamps should be filled. If the makers' instructions be followed we think the filling operation should also not be a hazardous one, and we thus consider that the lamp generally is one that well may be recommended. We would, however, emphasize the necessity of care in the process of filling, which is not only a matter of obtaining suitable appliances but one that relates to the personal attention of those entrusted with the actual filling operation. With care the lamp should be a most efficient appliance, but it certainly requires care in the filling operation. The following is the summary of the official report.

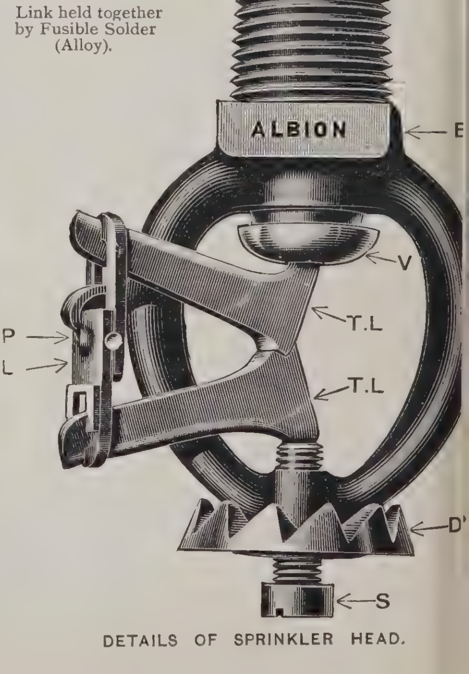
A Lamp called the Petrolite Lamp, and manufactured by Petrolite, Ltd.

Object of Test.—To test the safety of a lamp in the event of its being upset by accident or otherwise, also its liability to explode or give off explosive vapour after burning for a given period. *Note.*—Seven lamps of identical pattern were to be tested.

Summary of Effect.—The lamps stood the several tests made by the Committee as detailed, and on no occasion did the lamp fail to go out when upset, and no spirit escaped.

A Sprinkler.

The second test refers to a sprinkler, and is probably one of far-reaching importance, and for this reason it opens our eyes to the fact that although certain sprinklers are on the market marked to go off at 155 degs. Fahr., this does not necessarily mean that they will go off at the temperature so marked in actual practice. It simply means that the solde



DETAILS OF SPRINKLER HEAD.

not hold the parts together when in ing water of a temperature of 155 degs. ictual practice the temperature round the nkler can be easily 20 or 30 degs. higher ore the solder fuses, for the reason that metal of the sprinkler and piping conducts ay the heat rapidly: so rapidly in fact t until the pipes and sprinkler parts themes become sufficiently warm the sprinkler s not come into action.

he Albion sprinkler here reported upon, ar as we see, has come out very well in investigation, though, of course, also vhere near the recognized 155 degs.

Ve think it unwise of makers to stamp ir wares with the 155 degs., as it certainly kes and has made a wrong impression, whilst true in the scientific or laboratory se it is certainly not true for the purposes everyday practice. We are great believers the efficiency of a well-make sprinkler, first-class sprinklers can verily stand on ir merits without such an addition as the degs. stamp.

We are glad that this test with the bion sprinkler has been made by the Comttee, which we observe supplemented its estigations by private tests with other proved types of sprinkler heads. The ort has opened the eyes of those working th these appliances. In individual cases ouldering fires have existed for a conlerable period, and done considerable mage before the sprinklers have gone off, where it is a question of smouldering es the difference of 30 to 40 degs. is a very portant matter. These hitches are now blicly explained.

We congratulate the owners of the Albion rinkler for having pluckily come forward independent investigation, after having ssed through the usual Fire Office test. We glad, too, to observe that the owners of is sprinkler do not stamp their appliances th the 155 degs. mark, so common in other rections.

We believe this is the first instance where rinklers have been independently tested d publicly reported upon in this country, d it will be well if the whole series of rinklers on the market were dealt with by Committee so that the advantages and sadvantages of individual makes would be sily ascertainable.

tomatic Sprinklers submitted for Test by the Albion Sprinkler Company, Ltd.

Object of Test.—To record the action of the bion automatic sprinkler head under nditions similar to those existing during tual fires, and also as to its stability under riations of pressure.

Notes as to Tests applied.

(1) Sprinkler heads subjected to a test with gard to sensitiveness and the falling away struts, levers and valve seats, on opening—st, with sprinkler head dry; secondly, th sprinkler head charged with water at temperature of the air under a pressure of lbs. per sq. in. (0·8 atmospheres).

(2) Sprinkler heads subject to a fire test in chamber 20ft. by 10ft. by 9ft. 6in. (6·1 by 5 by 2·9 m.) high from floor to underside joists with sprinklers charged with water der a pressure of 10lbs. per sq. in. (0·66 ms.) to ascertain—first, the time and temrature required to open; secondly, distrition of water. Each test applied to a rinkler head placed pendent under, and to sprinkler head inverted over the respective pply pipes.

(3) Sprinkler head subject to a test to show power to resist leakage or injury under dden variation of water pressure up to olbs. per sq. in. (33·33 atms.).

Summary of Results.

(1) *Sensitiveness.*—With heads inverted and bjected to a gradual rise of temperature sprinklers opened at a temperature of 4 degs. Fahr. (95·5 degs. C.) when wet, and at 208 degs. Fahr. (97·7 degs. C.) when dry, an average of 201 degs. Fahr. (93·8 degs. C.). With sprinkler heads pendent the average temperature at which they opened was 181 degs. Fahr. (82·7 degs. C.) dry and 190 degs. Fahr. (87·7 degs. C.) wet, the average of both dry and wet being 185 degs. Fahr. (85 degs. C.).

(2) *Sensitiveness and Water-distribution.*—With sprinklers subjected to a quick fire heat and charged at a pressure of 10lbs. (0·66 atms.), they opened when inverted at an average temperature of 209 degs. Fahr. (98·3 degs. C.) in 240 seconds, and when pendent at an average temperature of 219 degs. Fahr. (103·8 degs. C.) in 180 seconds.

Note.—This test with pendent sprinklers was influenced by warmth remaining in walls and pipes after the test with inverted sprinklers.

In each case on the opening of a sprinkler the parts fell clear away, leaving the discharge free. The water distribution under the minimum pressure of 10lbs. per sq. in. (0·66 atms.) is recorded in the body of report.

Note.—The water distribution was unfavourably influenced by the nearness of the sprinkler heads to the underside of the joists.

(3) *Stability.*—The sprinkler heads sustained varying pressures up to 500lbs. per sq. in. (33·3 atms.) without leaking or change that could be discovered.

The London Fire Brigade's Gongs.—The old method of signalling the approach of a fire-engine by shouting has at last been done away with, and in its place there will be the more modern contrivance of loud sounding gongs. The improvement is a small one, both as far as the size of the appliance and the expense is concerned, but it will have a far-reaching effect, inasmuch as the men will not arrive on the scene of the fire with their larynxes as susceptible to smoke and gases as if they had been shouting all the way to the scene of the fire.

HANOVER DISTRICT FIRE STATION.

THIS district fire station probably ranks as one of the most remarkable ones in Europe, it having been the first to be equipped entirely with self-propelled fire appliances, of which there are three in the engine-house, one being a motor steam fire-engine, one a motor chemical engine and the third a motor trap.

The building was originally erected as an ordinary fire station with horsed engines, but has since been adapted for its more modern purpose. Architecturally, it is typical of recent German municipal work, showing the half-timber work gables so common to certain districts in Northern Europe. Its internal arrangement is certainly the primary cause for our referring to this station, and thus it is to this part that we would call attention.

THE MOTOR FIRE-ENGINE STATION, HANOVER.

The principal feature of the ground floor is the engine-house, which is occupied by three motor vehicles. Directly behind this engine-house is the sleeping-room for the men on duty, in the form of a dormitory with sixteen beds. These men thus sleep within a few feet of the appliances which they man. There is further, on the ground floor adjoining the engine-house, a room for the three foremen on duty, each in charge of one of the vehicles in question. Further, there is a large lavatory-room with washing accommodation for the foremen and men on this floor, and lastly a small room with its window on to the thoroughfare, which serves as a watch-room and affords accommodation for the fireman who does station duty.

The first floor is occupied by a large day-room for the sixteen men on duty, and another large day-room for the three foremen, these rooms being connected with the engine-house below by means of the usual sliding poles. Besides this, there is a large rest-room or recreation-room, fitted with a billiard-table and games, which can be considered the men's private room, inasmuch as they have strict orders not in any way to disturb themselves on the entrance of a superior officer, *i.e.*, to go on with their games or their occupations as if the superior officer were non-existent when in this special room, whilst of course should they be in any other part and a superior officer passes they are expected to interrupt their conversation and practically be at attention.

On the first floor there is also the office of the superior officer, *i.e.*, district officer in charge of the station, who has some rooms on this level and additional ones on the second floor. He has his own staircase and side entrance as well as own sliding poles from both bedroom and office.

The station is wonderfully compact in its arrangement, and we know as a fact that the regular turning out time of this station averages about 16 seconds at night and about 20 seconds by day; the quicker time at night being due to the fact that the men sleep so close to the actual appliances, whilst there is of course no time wasted in putting horses to.

The district station turns out with one superior officer, three foremen and sixteen men on three appliances—the chemical engine leading the way, the trap coming second, and the steamer coming third. The first two appliances are electrically driven; the third travels under its own steam.

Besides being most remarkable as a compact and practical station of extraordinary efficiency and great average rapidity in turning out, this station has also the advantage of being a most economical one, and we have ascertained that as a matter of fact the saving on the three motor appliances in two years, as compared with the expenditure in the maintenance of the less efficient horsed fire station, was no less than £1,028, taking the mark as equivalent to 1s. Seeing that the purchase of the three self-propelled appliances cost the municipality £2,120, we find that the economy of two years' work on these three motor appliances, which turn out as an eminently efficient unit, has actually paid half the capital expenditure upon this equipment, which is certainly a remarkable feature in the annals of fire-service economy.

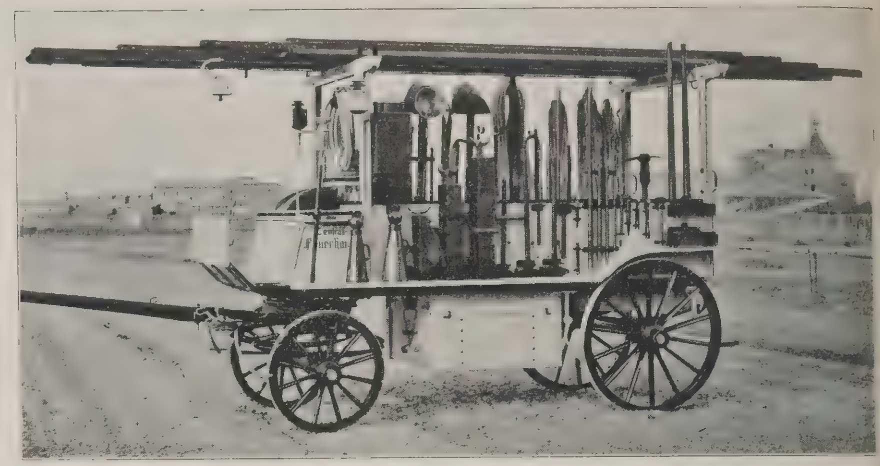
It is somewhat out of our sphere to go into detail regarding the economy and working of the appliances in question, which we had an opportunity to carefully investigate last month, but we certainly think that this little district station with its equipment stands so high in the annals of modern fire-brigade work that it well deserves illustration in these columns.

We also think it is only right to mention that the chief officer of the brigade at Hanover, of which this district station forms part, is Herr Reichel, formerly Inspector of the Berlin Royal Police Fire Brigade, of whom we recently announced his appointment to a chair at the Royal Technical College at Hanover, where his lectureship on fire protection is the first of its kind on the Continent of Europe.

A "DANGEROUS STRUCTURE" TRAP.

OF the various appliances seen by the members of the special commission who visited Munich last August, there was one vehicle which was of particular interest to the architects and surveyors of the party, This is the "dangerous structure" trap belonging to the professional fire brigade at Munich, the fire brigade in that city forming part of the general fire protective organization at the head of which is the chief surveyor of the city, who controls both the fire preventive and fire service side of his department.

In the same way as it was generally remarked by the members of that Commission what marvellous organization existed in some of the Continental centres for attending to the first-aid work in ambulance matters, so at Munich they found an excellent organization to deal with the question of dangerous structures.



A "DANGEROUS STRUCTURE" TRAP AT MUNICH.

Anyone who is acquainted with the usual practice of attending to dangerous structures in the Metropolis and in our provincial centres, will indeed comment on the advantages of having a dangerous structure squad organized on fire-brigade principles ready to turn out immediately at a moment's notice at fire-brigade pace and get to work with a number of useful appliances in a minimum of time. The men of this particular squad at Munich are, by-the-bye, firemen who have been scaffolders or artizans in the building trade.

The appliance we show is the one that turns out first, for there are other appliances such as a vehicle for carrying heavy balks of timber which can follow on when required. The appliance illustrated is, in other words, intended to afford that assistance the usual application of which is so often a question of seconds or minutes at the most and may save much life and value property.

The appliance stationed at headquarters is a horsed appliance of comparatively light build. It carries practically everything that can be wanted for first aid in respect to dangerous structures; thus it has an excellent supply of poles and tormentors: it has heavy pulleys, coils of heavy rope chains, axes, picks, crowbars, spades, saws, jacks of various descriptions, sledge-hammers, a searchlight, torches, temporary pedestal lights, a large supply of hooks, clamps, nails, screws, some short lengths of heavy boarding, some steel struts, &c. The men carried sit straddle leg down the centre of the trap on a bench. The trap has its own coachman and foreman who sits on the box. It makes its approach noticeable and clears the traffic by ringing a sharp bell which is worked by the foreman. On dark nights the trap, besides having its ordinary carriage lamps, has a torchlight to indicate its approach.

We consider this appliance, which was designed in accordance with the requirements of the local surveyor (Baurath Niedermayer), who acts as fire chief, and was built by Messrs. Weinhart, of Munich, to be one that well deserves the attention of the municipal authorities throughout the country.

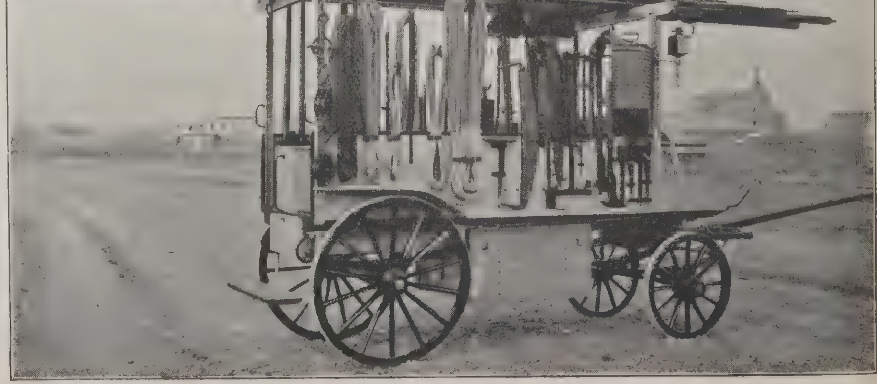
NOTICE.

PHOTOGRAPHS OF FIRES WANTED.

BOROUGH surveyors, insurance surveyors, fire-brigade officers and others are invited to send in photographs of fires for publication. Such photographs should comprise, if possible, a general view, but more particularly views of structural work and detail affected by fire. They should be accompanied by concise notes as to the fire as far as practicable. Communications should be marked "Fire Supplement" and addressed to the Editor, BUILDERS' JOURNAL 6, Great New Street, E.C.

Photographs of the following special subjects are particularly in request:—Iron doors armoured tin-clad doors, windows glazed with fire-resisting glazing, structural iron-work protected by concrete, terra-cotta o plaster. Floors of concrete, terra-cotta o plaster-slabs.

Photographs should not deal with fires earlier than January, 1903. Colonial and foreign photograph are equally welcome with British ones. Foreign photographs should be accompanied by particulars in either English, French or German, and no in any other language.



A "DANGEROUS STRUCTURE" TRAP AT MUNICH.

THE

BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

January 25, 1905. Vol. 21, No. 520. 6, Great New Street, Fetter Lane, E.C.

Summary.

The Soane Medallion has been won by Mr. S. Herbert Maw, the Pugin Studentship by Mr. E. Garratt, the Tite Prize by Mr. Robert Atkinson, and the Grissell Prize by Mr. James A. N. Hunter. (Page 49.)

Mr. Thomas Blashill, late superintending architect to the London County Council, died last Friday. (Page xiii.)

Opposition to the London Building Acts Amendment Bill is growing. The District Surveyors' Association has passed resolutions disapproving it. (Page 48.)

Trinity building, New York, now being erected, affords an excellent example of American steelwork construction and building organization. It will consist of twenty-one storeys and be more than 300ft. high. A characteristic feature in the operations is the manner in which material is brought on and taken away from the job: there is absolutely no room for the storage of materials, so that only the exact amount required each day can be delivered, while excavated material, together with all dirt and débris, must be cleared away at once. (Page 44.)

Good progress is being made with the King's Sanatorium at Midhurst, which is expected to be completed before the end of this year. (Page 52.)

An influential protest, headed by the president of the Royal Academy, is made to the London County Council against the proposed frontage line for the Strand improvement scheme, and the height of buildings already begun. (Page 52.)

A new outpatients' block to the Glasgow Western Infirmary has just been completed from Mr. Burnet's designs. (Page 48.)

Speaking at the annual dinner of the York Architectural Society last week, Mr. Butler Wilson said a draft Bill for architects' registration had been drawn up by the Institute committee and was now almost completed. (Page 48.)

The sending-in day for architectural works at the next Royal Academy Exhibition is March 24th. (Page 52.)

Wood poles for overhead tramway conductors are used in America, but they have a heavy appearance, and it is doubtful whether in the end they are cheaper than steel poles. Lattice-girder poles are said to be cheaper, but the painting necessary to preserve them from corrosion probably neutralizes the initial saving. (Page 51.)

Four important cases under the Workmen's Compensation Act were decided in the Court of Appeal last week. (Page 50.)

Verandahs are necessary around the walls of every habitable room, except those facing north, built in the plains of India. As regards the hills, there is no reason why buildings suited to an English climate should not serve their purpose equally well in India. (Page 49.)

"Dowsing." For some weeks past a controversy on the thorny question of "dowsing" has been going on in the columns of the "Times" which well merits attention. The attitude of our contemporary is one of incredulous disbelief; but in view of the testimony of several unimpeachable witnesses, deduced from personal observation of their own powers in the art of dowsing, backed by the supporting evidence of other trustworthy people who have witnessed these or other similar tests, the "Times" affects to believe that "half a dozen men of ordinary ability, powers of observation and common-sense could settle the whole question by putting half a dozen 'water finders' to the test." They might be able, but we doubt it. The difficulty would be to find six men sufficiently unprejudiced to record their observations and impressions in an impartial spirit. The mere subject of "water-finding" seems to raise a fire of fanaticism and intolerance that one could well wish limited to the regions of religious controversy. Not the least remarkable manifestation in this enquiry is the hostility of the pseudo-scientist. If there is one thing that this gentleman prides himself upon it is the possession or assumption of a healthy materialism that must necessarily, could he be brought to see it, prevent him from personally appreciating or experiencing those delicate physical phenomena to which "dowsing," if it has any scientific basis, belongs. The faculty of clairvoyance, of seeing visions, of personal magnetism, of all those manifestations which your pseudo-scientist lumps among the black arts, are admittedly of a nervous or neurotic type, a type that many may consider idiotic, childish or a nuisance, but which nevertheless exists and furnishes points of interesting study to all true scientific workers. The "dowsers" themselves admit that their power is entirely a psychological gift, which some possess in a greater degree than others. Necessarily therefore the efficacy of the power will vary, like all physical effects, according to the mental and physical condition of its possessor, and this may in part explain the non-success in some instances of "dowsers" who have previously been successful. But we doubt whether any percentage of successes less than 100 would satisfy your pseudo-scientist. He alone at the beginning of the twentieth century, when real scientific men stand at the borders of new worlds of psychical research, discounts all discovery by bald scepticism, and dismisses all unpalatable facts by the artless plea of coincidence. The controversy has brought out other interesting points—notably the gift many possess for wrangling over inessentials. As dowsers have worked with and without a twig it matters not how the twig is moved, whether consciously or sub-consciously; the point is, was water found? For the same reason the nature of the twig, whether hazel, willow or beech, is of little moment. These minutiæ may affect individual "dowsers"; but the main point is the psychical gift of the individual. The accredited successes of the "dowser" are frequently explained by the assumption that he was an expert geologist who relied on his knowledge for success, the dowsing being a "fake" for the benefit of the unwary. This is a futile argument. If it were so, it would pay the "dowser" to abandon the "no water, no pay" method, to set up as a geological expert and get his accounts passed by the Local Government Board, whether he found water or not. Our own attitude at present is entirely agnostical; we neither believe nor disbelieve. But the many authenticated successes of "dowsers," coupled with experiences of many people possessing "dowsing" powers, though not utilizing them for gain, should ensure an impartial investigation into the whole question. And if it were found that the matter resolved itself as one of the manifestations in certain individuals of the "N" or personal rays to which science has recently introduced us, we should not be surprised.

Four Appeal Cases. If there were not cases enough to substantiate the charge of ambiguity and faultiness of the Workmen's Compensation Act, the four that came before the Court of Appeal last week would amply supply any deficiency. Reports of these cases are given on pp. 50 and 51, but it is worth while here to point out what interpretations are possible under the Act. In one case it was argued that because a gantry was built of wood it was not a "building," and therefore the applicant was not entitled to compensation; in another it was shown that there was no provision in the Act that the scaffold must have been erected by the undertaker from whom compensation was claimed; in a third, concerning sewers, "engineering work" was held to include work done for the purpose of obtaining access to a sewer as well as the actual work of making an alteration in a sewer; while in the fourth case an extension to an electricity generating station was held to be a "building which exceeds 30ft. in height," though as a fact no part of the walls was more than 20ft. high. When so many interpretations can be put on the wording of the Act, the need for an absolute revision is apparent. Even judges are unable to understand it.

A NEW YORK SKYSCRAPER.

By E. KILBURN SCOTT, A.M.I.C.E.

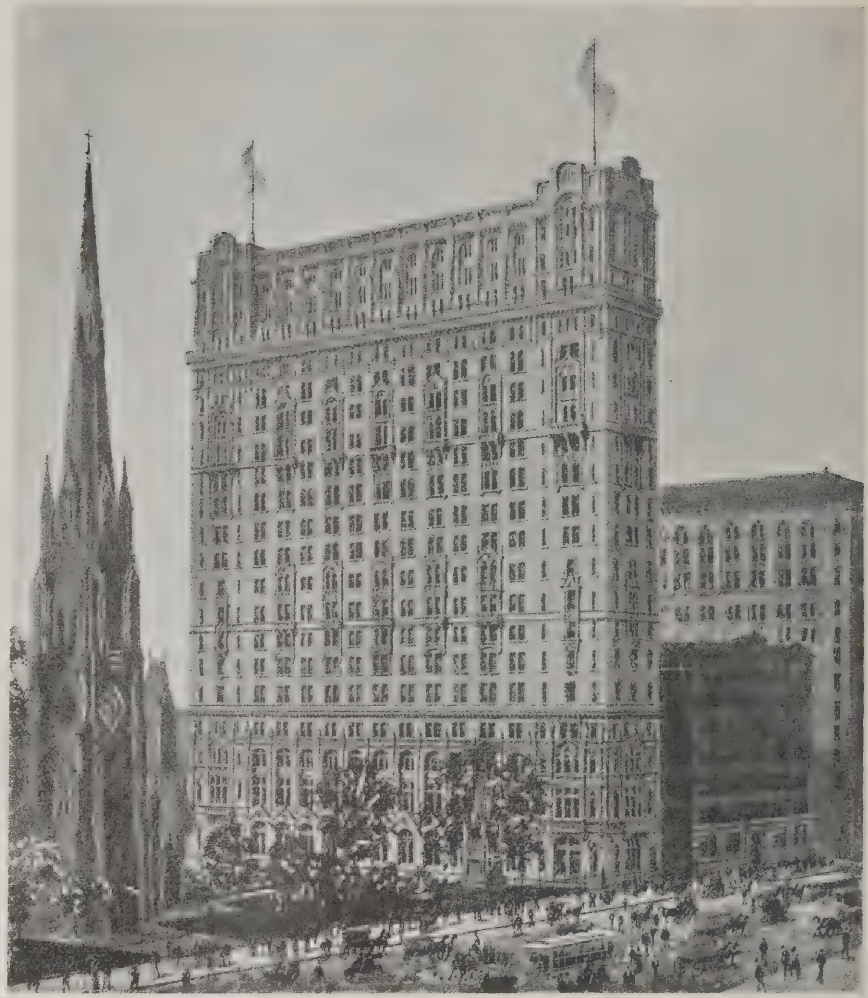
A FEW months ago the writer had an opportunity of going over Trinity building, New York, now in course of erection, and of taking photographs of some of the details. For this he is indebted to Mr. A. G. Ganson (of the G. J. Fuller Co., chief contractors), who superintended the erection of the famous Flat-iron building and during the last three years has built no fewer than four skyscrapers. Mr. Ganson is typical of many men who are in leading positions in the States in that he came out from the Old Country when a young man.

Site.

Trinity building stands on the north side of the well-known Trinity Church at the top of Wall Street. At one time the spire of this church was the most important landmark of New York, but now it is completely surrounded by skyscrapers, the view looking up Wall Street being the only one from which its beautiful proportions may be seen. This burying of church spires by buildings in which the pursuit of the almighty dollar is the only thought is typical of America; it certainly would not be tolerated in any other country. One result of it has been the introduction of a new and (the writer considers) degraded type of church architecture in which there is no tower or spire.

Size.

When completed the Trinity building will measure 240ft. along one side, 246ft. on the other, 41ft. along one end and 47ft. on the other. It will have twenty-one storeys and be over 300ft. high. At the time of the writer's visit (September last year) the fourteenth storey was in hand, but the twelfth storey was quite high enough to go crawling about a steel shell with only part of its flooring in.



TRINITY BUILDING, NEW YORK (AS IT WILL APPEAR WHEN COMPLETED, ADJOINING OLD TRINITY CHURCH). FRANK H. KIMBALL, ARCHITECT. S. C. WEISKOPFF, ENGINEER. GEORGE A. FULLER CO., BUILDERS.

TRINITY BUILDING, NEW YORK, SHOWING WALL ATTACHED TO STEELWORK.

Irregularity of Building.

It is interesting to note that every inch of space is taken advantage of, even although doing so means extra trouble and work in fitting the steel together. Thus it will be seen from the dimensions that not one of the four corners is a true right angle, and consequently the work of designing and setting-out the steel is more difficult than if the building had been an exact rectangle. Moreover, a building which is very narrow in proportion to its length and height has to be weighted to give stability, and this makes the design and building work more difficult. The Flat-iron building is a particular case of an exceptionally high building on a remarkably small base. It looks for all the world like a piece of cake which, by careful balancing, has been stuck up on edge.

Foundations.

Before removing the old building preliminary test borings were made by the jet process, and they indicated medium sand to 34ft., fine sand and quicksand to 74ft., and hard pan to 81ft., when rock was encountered. As ground-water level is 55ft. above the rock, and the fine and quicksand is unstable, it was necessary to build solid masonry foundations in pneumatic caissons and cofferdams.

The foundations for the centre rows of columns were sunk with cylindrical caissons, the cofferdams being of riveted steel construction. Along the two long sides of the building the caissons were rectangular, built of wood, with small clearances between so as to make a nearly continuous retaining wall.

All caissons and permanent cofferdams were filled with concrete, the upper surface on the rectangular piers being covered with single tiers of 20in. and 24in. I beams grouted in so as to distribute the pressure from the column pedestals to the concrete.

Speed of Caisson Work.

Work was commenced on March 10th, 1904; the first caisson was delivered on March 28th, and sinking with air-pressure commenced on March 30th. The maximum air-pressure was 27 lbs. per sq. in., and the maximum rate of sinking in sand about 1ft. per hour and in hard pan one-third of this rate. The fifty caissons were sunk in fifty-one days, from 300 to 500 tons of pig-iron being required for weighing them down. This pig-iron was removed from one to the other as required.

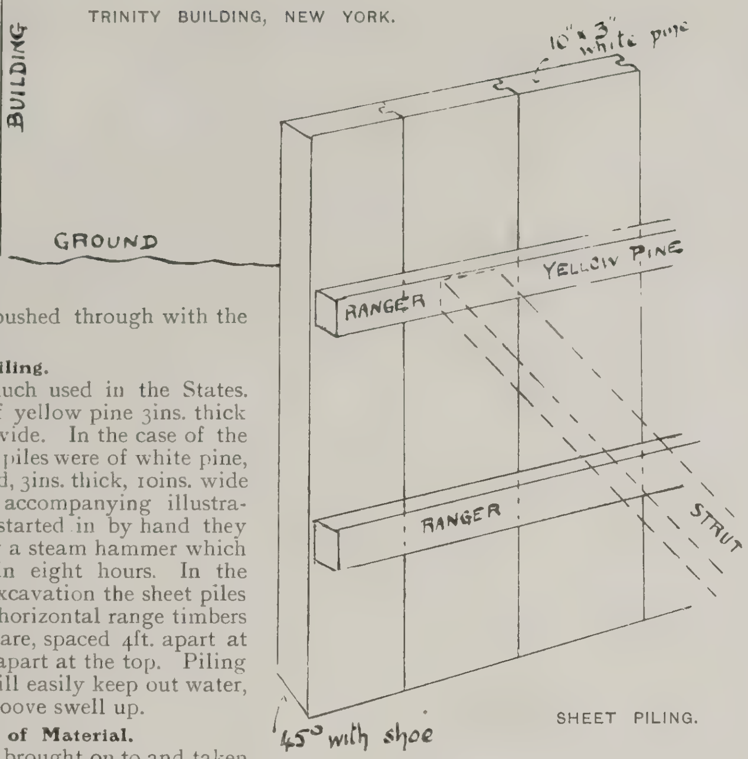
Speed of Excavation.

The entire building area was excavated in sand and gravel to a depth of 23½ft. below the level of Broadway, except at Trinity Place end, where it was 5ft. lower. The total amount of excavation, including old masonry and exclusive of the materials dug out of the caissons, was about 6,000 cub. yds., and this was removed by pick and shovel in thirty days by an average force of thirty men and twenty teams.

Convenience of Workmen considered.

As in all large contracts in the States, the convenience of the men has been considered, for the employers go on the principle that if they treat their employees well they will get a better class of men and the maximum amount of work out of them. For example, the "sand-hogs," as the men are called who do the sinking in the caissons, had dressing-rooms, hot-water baths and lounging-rooms provided for them. The foundation work was carried out continuously in three eight-hour shifts of 125 men, each including three five-men gangs of "sand-hogs."

TRINITY BUILDING, NEW YORK.



SHEET PILING.

The Trinity building has been delayed on account of the building trade strike in the New York district, but when in full operation between 800 and 900 men find employment on the work, and they represent all trades on the register. Wages are of course much higher than in England, so work has to be pushed through with the greatest expedition.

Piling.

Sheet piling is much used in the States. It usually consists of yellow pine 3ins. thick and 10ins. or 12ins. wide. In the case of the Trinity building the piles were of white pine, tongued and grooved, 3ins. thick, 10ins. wide and 22ft. long (see accompanying illustration). After being started in by hand they were followed up by a steam hammer which drove 150 lin. ft. in eight hours. In the deepest part of the excavation the sheet piles were braced by five horizontal range timbers 49ft. long, 12ins. square, spaced 4ft. apart at the bottom and 6ft. apart at the top. Piling put in in this way will easily keep out water, as the tongue and groove swell up.

Cartage of Material.

All the material is brought on to and taken away from the site *via* Trinity Place, as this is a less frequented street than Broadway. In getting out the excavations the carts went on an inclined roadway sloping down from Trinity Place, the soil of this roadway being afterwards shovelled into buckets and delivered by derricks to wagons at street level. At the present time the roadway runs in on the level from Trinity Place, at the side of the building, and is just wide enough for two carts to pass.

It may be mentioned that in the erection of these buildings the whole question of transporting the materials and men, &c., to and from the building site, and in proper sequence, is as carefully-thought-out as the details for an army corps. Seeing that as many as 1,000 men may be at work on the buildings, the importance of doing so is evident. There is no such thing as dumping a week's or a month's quota of material, as is possible under many English contracts.

Derricks.

There are two derrick towers, having each two 50ft. booms, and also four smaller derricks, all being so spaced that the entire area of the building is commanded. Steam for these derricks, as also for the air compressors, pumps, drills and other machinery, is purchased from the New York Steam Co. The engines for the derricks are in the basement and wire ropes run up from them. The derricks are moved up three storeys at a time, and are only used to lift steel and stone, all other material, such as bricks, cement, &c., being raised by temporary lifts fixed outside the building.

The latest practice in the States is to use electric motors entirely. For example, on the Wanamaker Stores building at Philadelphia the writer saw some exceedingly neat derricks and winches, &c., driven electrically. There is no doubt whatever that electric power is well fitted for this work, and the higher the building and greater the distance the more is its flexibility and economy made manifest.

Storage of Materials.

The whole essence of building skyscrapers lies in careful organization and the accurate figuring-out of the work from day to day. In a valuable part of the city, such as around Trinity Church, there is absolutely no room for the storage of materials, so that only the exact amount required each day can be delivered, and any materials excavated, together with all dirt and débris, &c., must be cleared away at once. When one considers that all the loading or carting involved has to be done through the crowded streets around Broadway and Wall Street in the face of exacting city regulations as to disturbance of traffic, it will be seen that the position of superintendent of a skyscraper building is no easy job.

Sub-Contractors.

In case of the failure of a sub-contractor to deliver his quota of the materials on any particular day, the main contractor goes out into the open market and buys whatever he can and at any price, and charges up the expense to the sub-contractor. There is a strict clause in the agreement that this may be done, and it is quite frequently enforced.

Speed of Building Steel Construction.

The speed at which the steel constructional work goes on is extraordinary. The Trinity building has made no records in this line because the whole building trade of New York has been disorganized for some time past by strikes, sometimes as many as 6,000 union men having been out, thus affecting about 20,000 hands.

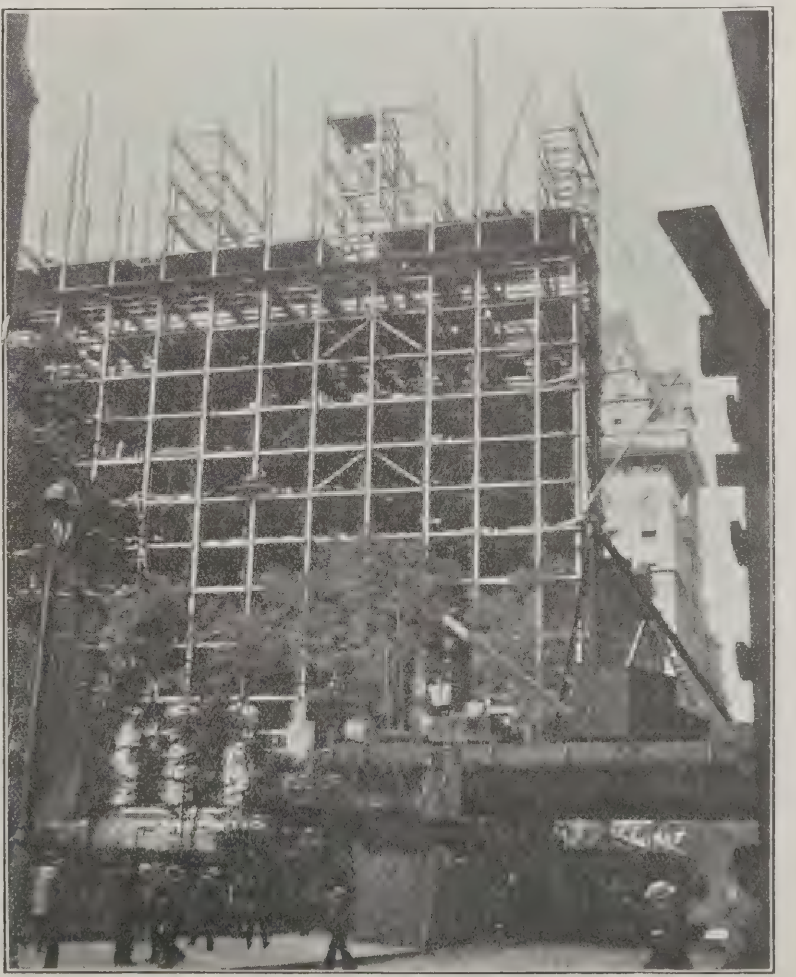
However, in the case of the Flat-iron building Mr. Ganson's records show that the whole of the steel construction from the side-walk up, including the masonry of the outside, was completed in three months. He expects to complete the steelwork of the Trinity building in 3½ months.

Columns.

The steel structure is carried on fifty steel columns arranged in three longitudinal rows, and the maximum assumed load on each column is about 1,000 tons. The magnificent simplicity of this steel construction is well shown by an examination of these main columns, for all that is necessary to give any requisite strength is to rivet on more and more 1in. thick plates to the standard section I beams, which go from the bottom to the top of the building.

Riveting.

The riveting is carried out by compressed air hammers something like caulking tools,

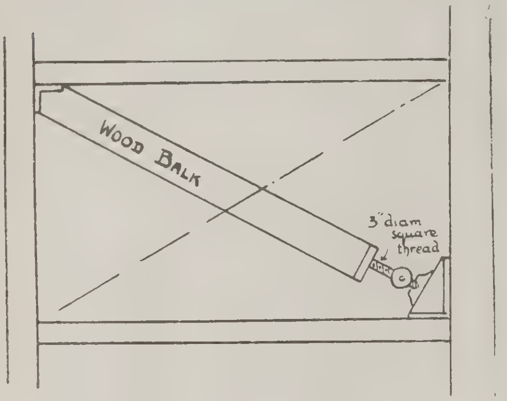


TRINITY BUILDING, NEW YORK, SHOWING SCAFFOLDING.

and about as noisy. Each hammer closes 300 to 350 rivets of $\frac{7}{8}$in. diameter per day of eight hours. Where electricity is employed for the derricks and winches, &c., there is no reason why electric riveters should not be employed. It would, however, be as simple to instal several electrically-driven air compressors at convenient points, in this way combining the advantages of electricity and air compression.

Bracing.

It will be easily seen that in carrying up a building twenty-one storeys high on a base averaging only 243ft. long by 43ft. wide great care must be taken to thoroughly brace the shell to withstand anything it may have to withstand in the way of wind-pressure.



TEMPORARY CROSS BRACING.

In the case of Trinity building these cross-braces consist of balks of timber 12ins. square set diagonally from the opposite corners of the main pillars. The ends are shod with iron and pointed. For tightening purposes a 3in. diameter square-thread screw is provided at the lower end, the head having capstan holes for the insertion of a crowbar. These braces are set alternately one way and the other right along the building so as to make everything quite rigid until the interior walling and framing is in position.

Flooring.

The flooring is built on what is known as the flat arch construction, and consists of blocks of terra-cotta having ventilating holes through. The ends are shaped at an angle and are set together in cement. There is supposed to be a slight camber, the drawing showing a couple of inches, but in the actual building the floor appeared to be constructed quite flat. In the photograph given below a workman is shown holding one of these terra-cotta blocks. Such is the strength of this flooring that on one occasion a derrick which fell through a floor was held up at the next. Occasionally coke-breeze concrete has been employed for the flooring, but terra - cotta is much better and safer, as in case of a fire the coke-breeze would undoubtedly burn; a plumber's fire has even been known to burn its way through such a floor. Its use in a building like the Savoy Hotel cannot therefore be too strongly condemned.

Concrete.

The concrete consists of 1 of best Leligh Portland cement, 3 of sharp sand and 4 of crushed limestone, broken to pass through a 1$\frac{1}{2}$in. screen. It was mixed on two mixing floors and handled into each caisson by two $\frac{1}{2}$-cubic-yard steel dumping buckets suspended from the upper edge, and arranged to hang plumb, even if eccentrically loaded. They pass through the air-lock in 60 seconds, and having special bottoms empty quickly and thoroughly.

View showing Steel Straps for fastening Masonry to Steel Framework.

Cement-mortar.

The cement-mortar for setting the masonry, brickwork and tilework, &c., consists of 1 of best Leligh Portland cement and 3 of sharp sand. It is delivered all ready mixed in bags from the factory, and only requires the addition of water. Owing to this, and the fact that all the stonework is worked up at the factory so that it exactly fits into its position, there is remarkably little dirt and dust about. Such as there is is got rid of by special dust chutes.

Masonry.

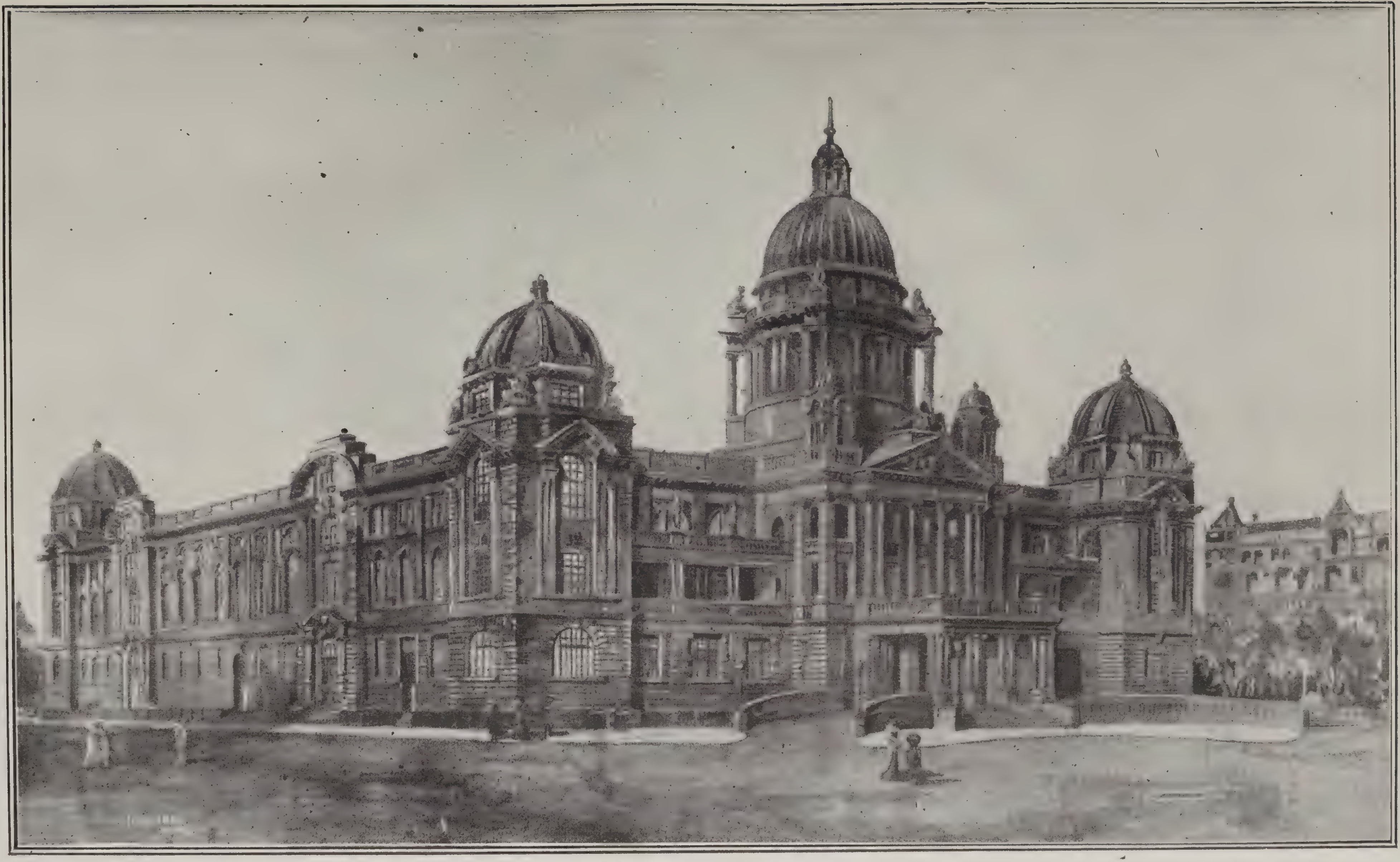
In September last the masonry of the second storey was being added. It consists of machine-shaped blocks of Indiana limestone, a material which cuts quite easily when newly quarried but acquires a hard surface after weathering. Each block of masonry is attached to the steel structure by a steel tie about 2ins. by $\frac{1}{2}$in., having its ends turned at right angles, one being bedded into the masonry block and the other riveted to the steelwork as shown above.

Laying Terra-cotta Fireproof Flooring.

View looking along Tenth Storey, showing Terra-cotta Flooring Blocks.

TRINITY BUILDING, NEW YORK.

Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, January 25th, 1905.



THE NEW CITY HALL AND MUNICIPAL BUILDINGS, DURBAN. SCOTT, WOOLOCOTT AND HUDSON, ARCHITECTS.

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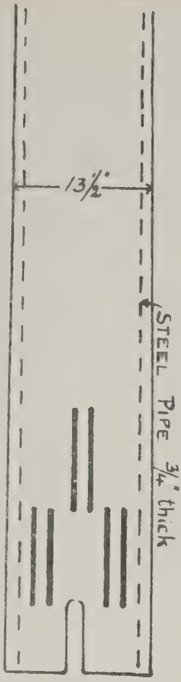


STEEL DRILL FOR CUTTING HOLES FOR RAMS OF HYDRAULIC LIFTS.

Brickwork.

The brickwork at the bottom is 4½ft. through, and tapers off until at the top it is 2ft 4ins. It is lined inside with terra-cotta ventilated tiles 3ins. thick at the bottom and 2ins. thick at the top. These tiles are also used for dividing off the interior rooms. They are 6ins. and 4ins. thick, according to their position in the building. On the interior surface of the lower floors and walls there are damp-courses of bitumenized paper laid on with hot pitch and having a pitch covering.

Fireproof Staircase.

In order to carry out the fireproof character of the building in its entirety, the staircases are wholly of steel, with cement or granolithic treads. The staircase goes straight up from floor to floor, and is tiresomely like that of a lighthouse, but then, of course, it will not be much used.

Chimney.

The chimney runs alongside the staircase, and is built of steel plates. It measures about 5ft. by 2½ft., and is lagged with asbestos blocks measuring 18ins. by 4ins. by 2ins., set up edgeways, and held on with planished sheet-steel and steel bands.

Elevators.

Although the majority of the elevators in the States are worked electrically, yet one does occasionally come across a modern building fitted with hydraulic elevators. The proprietors of the Trinity building are apparently predisposed in favour of hydraulic, because when I was there drills were at work cutting the holes for the hydraulic rams. Six holes are being sunk through solid rock to a depth of 300ft. and three holes to a depth of 150ft. There will be eleven elevators altogether.

The drills work night and day without a break, and they consist of hard steel tubing of 13½ins. diameter and ¾in. thick. At the lower end of the tube the cutting edges are simply arranged by cutting two parallel slits at intervals. Each pair of slits is about 8ins. long, and as the tube wears away, first one pair of slits and then the other come into use, the piece of metal between the slits breaking out and so giving the required cutting edges.

Views and Reviews.

L.M.B.A. Diary and Handbook.

In the same form as before, the 1905 edition of this publication of the London Master-Builders' Association now reaches us. It gives particulars of wages, prices of timber, a glossary of electrical terms, the index to the London Building Act, a list of district surveyors, and various building memoranda and formulæ, all very handy in conjunction with a diary, though, as we have remarked before, there are other books that cover practically the same field.

"Diary and Handbook of the London Master-Builders' Association," edited and published by the Association, 31 and 32, Bedford Street, Strand, W.C., price 2s. 6d.

Portland Cement.

Among the many books which have been published on the subject of Portland cement, this, by the late Henry Faija, has deservedly been very popular. It only attempts to treat the subject in a very elementary manner, from the point of view of users, but that purpose it fulfils admirably, it being written very clearly and succinctly. Mr. D.B. Butler, who has revised and enlarged this fifth edition, has brought the book up to date, making alterations only where the original opinions were erroneous in the light of modern research. The chief new features are a revised form of specification, a chapter on adulteration, and a more modern series of analyses of raw materials, &c.

"Portland Cement for Users," by the late Henry Faija, revised by D. B. Butler, A.M.I.C.E., F.C.S., &c. London: Crosby Lockwood & Son, 7, Stationers' Hall Court, Ludgate Hill, E.C., price 2s.

Pocket-books for Electrical Engineers.

In the preface to both these new editions special emphasis is laid on the increasing sale of the books, which is not surprising when one remembers how extremely convenient these collections of formulæ, tables and condensed particulars are to working electrical engineers. Both pocket-books have been revised and enlarged again. They furnish particulars on every branch of the electrical engineering profession and present facts and figures in the concisest form. Fowler's year-book is quite the better (and the bigger) of the two, but the other will be found very useful, especially for its diary and "particulars for estimating for work" at the end of the book.

"Fowler's Electrical Engineer's Year-book and Directory of Light, Power and Traction Stations for 1905." Manchester: Scientific Publishing Co., 1s. 6d. nett. (post free, 1s. 9d).

"The Practical Electrician's Pocket-book for 1905," edited by H. T. Crewe, M.I.M.E. London: S. Rentell & Co., Ltd., 36, Maiden Lane, Strand, W.C., and Dawbarn & Ward, Ltd., 6, Farringdon Avenue, E.C., price 1s. 6d. nett.

New Edition of Fletcher's "Arbitrations."

A third edition of this book is now before us. It has been thoroughly revised and brought up to date by the inclusion of cases bearing on the several points, in addition to which considerable additions have been made to the various sections. The book is admirably produced.

"Arbitrations," by the late Prof. Banister Fletcher, Third edition, revised and largely rewritten by Banister F. Fletcher and H. Phillips Fletcher, FF.R.I.B.A., FF.R.S.I. London: B. T. Batsford, 94, High Holborn, W.C., price 5s. 6d.

Electric Lighting of Private Houses.

This was originally a series of articles in the "Model Engineer and Electrician," now collected together in book form, with the addition of a chapter on private generating plant: "and in this form it is hoped that the book may prove of service to those who, though not necessarily electrically trained, yet wish to gain an intelligent and accurate idea of good modern practice in the electric lighting of private houses." The particulars furnished have been given before in various forms, and the illustrations—as usual with this class of book—seem mostly to be taken from manufacturers' catalogues. There is nothing of particular interest to say in respect of the book, but the publishers doubtless know there is a market for it. Architects and builders, for instance, will find it handy, and as such we gladly draw attention to it.

"Private House Electric Lighting," by Frederic H. Taylor, A.M.I.C.E. London: Percival Marshall & Co., 26-29, Poppin's Court, Fleet Street, E.C., price 1s. nett.

Planning.

The second edition of this work is a considerable improvement on the first. It is, as we said in our review of the latter in our issue for April 10th, 1901, "memorabilia" rather than "principia," but it serves a very useful purpose. This edition has been considerably enlarged and plans added that bring the book more up to date and enlarge its scope. Whereas the first edition contained 80 plans, the present contains 150. The book collects into handy form many valuable data, and will be of great assistance to every practising architect. A new feature is a "tabulated list of useful memoranda," while there are six appendices, giving (1) section 80 of the London Building Act, 1894; (2) the L.C.C. theatre by-laws; (3 and 4) Board of Education codes for elementary and secondary schools; (5) L.C.C. by-laws under section 39 (1) of the Public Health (London) Act, 1891; and (6) extracts from ths Factory and Workshop Act, 1901.

"The Principles of Planning," by Percy L. Marks. London: B. T. Batsford, 94, High Holborn, W.C., price 8s. 6d. nett.

OUR PLATES.

FROM time to time we have given particulars—and latterly some illustrations—of new buildings in Cape Town, Johannesburg, Durban and other growing centres of business in South Africa. Through the courtesy of "The British and South African Export Gazette" we are now able to give a view of the new town hall and municipal buildings at Durban, which are to be proceeded with immediately, and when complete will be the finest block of public offices in South Africa. The scheme will cost £320,000, of which practically one-third will be covered by the £100,000 for which the Government has purchased the old town hall. This latter is to be used for postal and telegraphic purposes: the building was completed in 1885 at a cost of £50,000 and is of the Corinthian order of architecture with a clock tower 164ft. high. The architects of the new town hall and municipal buildings are Messrs. Scott, Woolocott & Hudson, of Johannesburg and London, whose design was selected in competition at the end of 1903. Since then, however, the plans have been considerably altered. Instead of a clock tower, such as was suggested in the original design, a dome has been adopted as the centre feature of the facade, and will face the new street which is to be cut through the Town Gardens. The corner towers with their small domes have been recast to harmonize with the centre feature, and the West Street front has been largely remodelled. Greater spaciousness has also been gained from the vestibule to the large hall, which is capable of accommodating 3,200 persons. In the basement is a lecture hall. The half basement, where the supper room, lecture hall, refreshment room, kitchen and other offices will be situated, will be easily accessible, special entrances to the rooms being provided from the main entrance hall. The library will be on the ground floor, the museum on the first floor and the art gallery on the second floor. The offices of the borough engineer, electrical engineer, borough surveyor and medical officer of health will be placed in the half basement, the town treasurer's and building inspector's departments being on the ground floor. Above these will come the rooms of the town clerk, town solicitor, and tramway department. The council chamber is close to the grand staircase hall. On the first and second floors cloak, retiring, refreshment and lavatory rooms will be provided, with ample accommodation at the rear of the orchestra on both floors. The galleries at the end of the large hall will be provided with ample exits and crush halls or foyers, and there will be sufficient promenade space on each floor to accommodate the whole of the occupants of each gallery in case of emergency.

The lodge at Pembury, Kent, has been erected from the designs of Messrs. C. E. Mallows & Grocock, of London and Bedford, and is an interesting example of country house design. The lodge to it was illustrated in our issue for August 10th last.

The United States Court House, Custom House and Post-Office at Wheeling, W. Va., is a fine example of the monumental Classic work now being carried out in America. The design, of course, is essentially French in feeling. The drawing itself is magnificent—far superior to anything that comes out of English drawing-offices.

COMPETITION REFORM SOCIETY.

THE third annual report of this Society for the year ending December 31st last (to be presented to the annual general meeting at 9, Conduit Street, W., to-morrow) states that increased evidence has been afforded of the wide-spread recognition of the Society's aims and usefulness.

It is worthy of note that out of the 67 cases of competitions considered in 1903, 17 were disapproved, while out of 70 dealt with in 1904 only 11 were considered unsatisfactory; so it would seem that a proper relation between competitors and promoters is becoming more general. Matters in connection with limited competitions have on several occasions been referred to the Committee, but the Society as at present constituted being limited to the field of open competition, action was taken only so far as the questions involved were matters of principle.

In April the Committee submitted to a special general meeting some proposed additions and alterations to the R.I.B.A.'s suggestions for the conduct of architectural competitions.

These proposed additions and alterations may be summarized as follows:—

A jury of three assessors should be appointed for all open competitions.

The functions and duties of assessors should be clearly defined in the conditions.

Conditions should be under the seal of the promoters in order to constitute a contract between them and the competitors.

The assessors, in addition to other duties, should approve the site; satisfy themselves as to the *bona fides* of the promoters' intentions to carry out the scheme; clearly define which of the conditions must be adhered to, and which may be followed or not at the competitor's discretion; and adjudge the competition solely upon information supplied. The assessor's award to be in writing and published verbatim immediately after the decision has been made.

Perspectives are generally unnecessary; if required, they should be prepared at the promoters' cost and under the assessor's direction, after the designs have been received.

Competitions should always be open when they are for public work undertaken with public moneys where the proposed expenditure is £10,000 or more.

The total amount of premiums should not be less than 1 per cent. of the assessor's estimate of cost, and should be paid in addition to the usual professional charges.

The deposit required for conditions should not exceed one guinea.

If work be not carried out within twelve months of selection, adequate compensation should be paid in accordance with the R.I.B.A. scale of charges.

If only part of the original design be carried out, payment should be made in respect of the deferred portion.

The assessors should be the sole judges of the fitness of the successful competitor to be employed.

An agreement should be entered into between the promoters and the successful architect, stating terms of engagement, &c.

A resolution was passed "that all the suggestions for the conduct of architectural competitions which may be adopted by the R.I.B.A. should be made rules to be compulsorily enforced upon promoters, assessors and competitors." Fifteen copies of the revised suggestions, and a copy of the resolution, were sent to the secretary of the Institute, with a request that he would place them before the R.I.B.A. Competitions Committee in order that they might be considered in conjunction with the Committee's own proposals, it having been ascertained that that Committee was about to revise the "Suggestions."

The following names have been added to the list of members (of London where not otherwise stated):—H. R. Appelbee, A. E. Corbett (Manchester), G. Fox, G. Hubbard, W. G. Hopkins, H. H. Langston, A. W. Moore, S. V. North, W. G. Payton (Birmingham), E. A. Robins, A. Saxon Snell, P. B. Tubbs, Butler Wilson (Leeds). The following members have resigned: Louis Ambler, R. Stephen Ayling, J. Langham, R. H. Morton, E. V. New, A. J. Penty.

At the annual general meeting held on February 5th, 1904, a motion stood upon the agenda that the annual subscription should be raised to 10s. 6d., but in view of the many letters which had been received objecting to the proposal, the motion was withdrawn and an amendment agreed to inviting members to subscribe, in addition to their annual subscription, a further sum of 5s. towards paying off the deficit of the Society. Thirty-seven members responded to the appeal. The accounts now show a balance of about £10 to the good.

YORK ARCHITECTURAL SOCIETY.

AT the annual dinner of the York Architectural Society held last week, the president, Mr. Herbert Davis, F.R.I.B.A., of Scarborough, said that architecture was not, and never could be, placed on the same plane as the arts of sculpture and painting, because the architect was too much fettered by the conditions under which he had to work to be called an artist pure and simple. Speaking of illicit commissions he said that these only really existed among the small class of men whom one would scorn to call members of the profession. The reason of accusations of illicit commissions being received by architects was that so many architects were such bad business men that the mistakes made by them gave rise in the minds of their clients to the thought that their interests from a business point of view were not being attended to, or that the laxity and indifference that was shown had some other underhand explanation. Mr. Arthur Pollard, in proposing the toast of the Royal Institute of British Architects, referred to the memorial issued by the Institute in regard to important architectural work being carried out by borough surveyors, 75 per cent. of whom, he said, were not equal to the task. He spoke in favour of registration. Touching on the same matter, Mr. Butler Wilson said the Institute Committee appointed in June last year had held many meetings and a draft Bill was now almost completed.

NEW OUTPATIENTS' DEPARTMENT AT GLASGOW WESTERN INFIRMARY.

THE new buildings for outpatients at the Glasgow Western Infirmary were opened on Wednesday last. They are situated to the west of the main infirmary block and form part of a scheme for the extension of the infirmary to the west, which is urgently needed. The new patients' waiting-room is 26ft. by 16ft. and is in communication with a diagnosis room for the examination and classification of cases.

The general waiting hall, 86ft. by 31ft., is seated for over 400 persons, and out of it leads a corridor eastward to the main operating theatre, which is 30ft. by 29ft., with gallery accommodation for sixty students.

Small lobbies lead off the waiting hall to five medical and surgical consulting rooms, with their necessary dressing-rooms; each consulting room is 24ft. by 24ft., with gallery accommodation for fifty students, the lighting (as in the operating theatre) being from the north. At the west end the communication corridor leads into the ear, nose and throat rooms. From each of the consulting rooms doors lead to the exit corridor, which runs along the entire north and west walls of the building and ends in the dispensary waiting hall. This hall (30ft. by 19ft.) is seated for seventy persons, and has two hatches into the dispensing-room (30ft. by 30ft.).

The heating of the buildings is by low-pressure hot water on the Reck patent system, the circulating water being warmed by steam, which is taken from the main boilers of the institution. The steam is led into a heating chamber in the basement of the dispensary, where it is reduced to a low pressure before being applied to the heating system. There are 115 radiators in the various rooms, representing 6,200 sq. ft. of heating surface, or 1,000,000 British thermal units per hour.

Ventilation is effected by four extract electric fans, the incoming fresh air being introduced into ducts through copper gauze screens, passing afterwards through registers fixed in the walls immediately behind the radiators, and about 6ins. above the floor: the extract registers being in the ceilings and connected to shafts in the roof leading to the fans. The apparatus is capable of maintaining a temperature of 60 degs. Fahr. in the rooms and in the waiting hall when the temperature of the outer air is 25 degs. Fahr. The fans are able to change the air in the rooms six times an hour and in the large waiting hall ten times an hour.

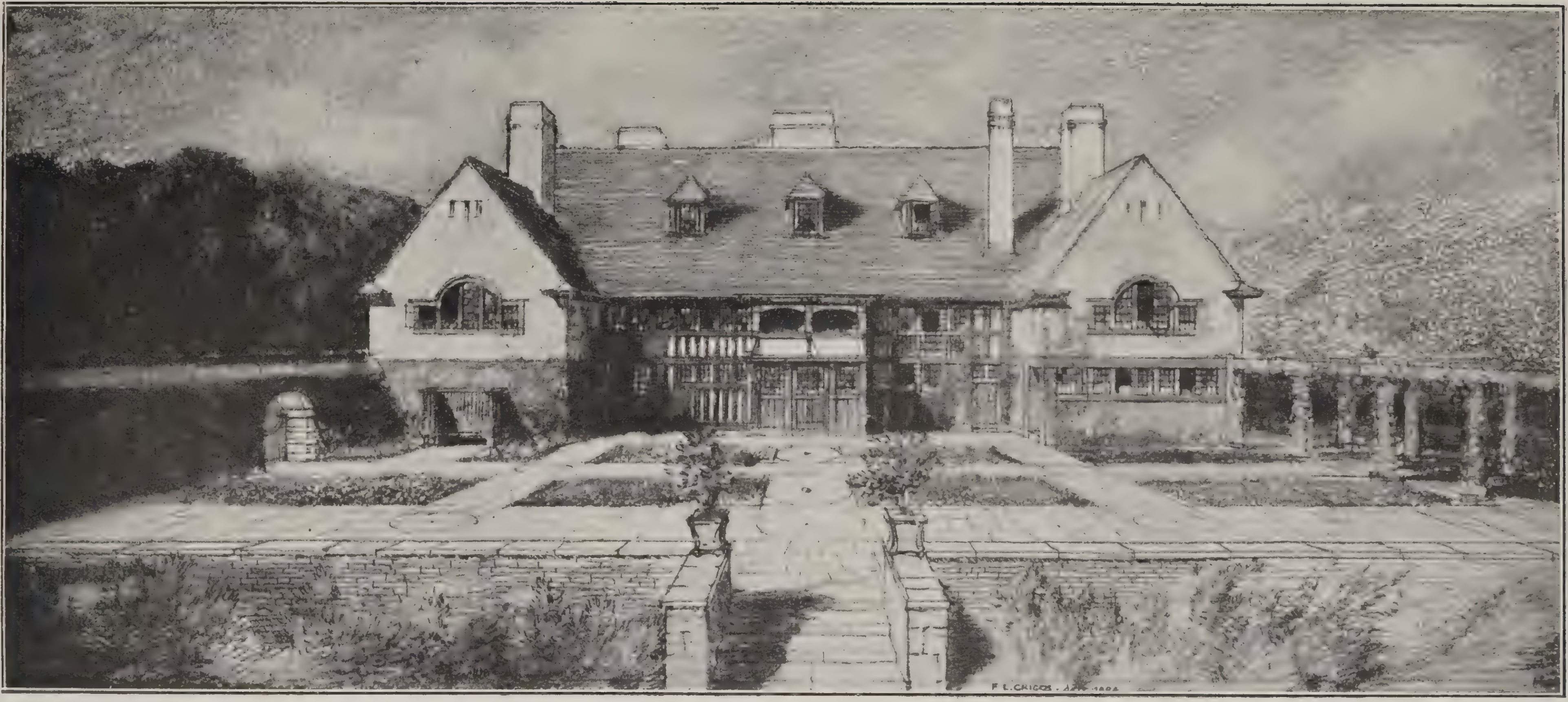
The building has been erected from the designs of Mr. John James Burnet, A.R.S.A., and the lighting and heating have been carried out under the direction of Mr. Thomas Young.

THE LONDON BUILDING ACTS AMENDMENT BILL.

OPPOSITION to the London Building Acts Amendment Bill (which is stated to have passed the examiners of private Bills) is gathering strength, says the "City Press." The uncompromising hostility of the Corporation is assured, the Duke of Westminster is said to be opposing the measure on his own account, and the Property Owners' Association (which represents two-thirds of the ratable value of the City) will also oppose it. The Kensington Borough Council has passed a resolution suggesting a conference of the local authorities on the subject, to consider what joint action shall be taken in respect to the Bill, and the District Surveyors' Association has passed resolutions that whereas the London Building Act, 1894, comprises about 700 clauses and four schedules of fourteen pages, and it is now proposed to add to this and the amending Act of 1898 a further Bill of nearly 400 clauses (and two schedules), the majority of which have to be read into the sections of the first-named Act, this Association, without reference to the merits of the proposals, submits that such a measure will be absolutely unworkable, that it will be almost impossible to grasp its provisions, and that such a combination, uncertain in its meaning and complicated as it will be, must inevitably lead to constant litigation. They further submit that the only satisfactory course in order to accomplish an amendment of the magnitude contemplated is to embody them in a new Bill to supersede the present Acts, which should only be brought before Parliament after careful consideration by the various authorities and professional societies interested therein. They further submit that many of the powers proposed to be taken by the L.C.C. are to a considerable extent such as should in the public interest be the subject of specific rules to be enacted by Parliament, and be administered by the district surveyors, who should be persons qualified by education and experience for that office. The constant reference to the Council will also cause uncertainty, great delay and expense to the public.

London's new Reservoir.—The latest addition to the water service of London is a new circulating reservoir at Sundridge Park, Bickley. On plan it is like a circular maze, its object being to ensure the constant movement of the $1\frac{1}{2}$ million gallons of water which it contains. Owing to the numerous circular channels through which it has to pass, the water makes a journey of half a mile before reaching the outlet in the centre. The reservoir was designed by Mr. William Morris.

Supplement to
The Builders' Journal and Architectural Record,
Wednesday, January 25th, 1905.



HOUSE AT PEMBURY, KENT: GARDEN FRONT. C. E. MALLOWS AND GROCOCK. ARCHITECTS.

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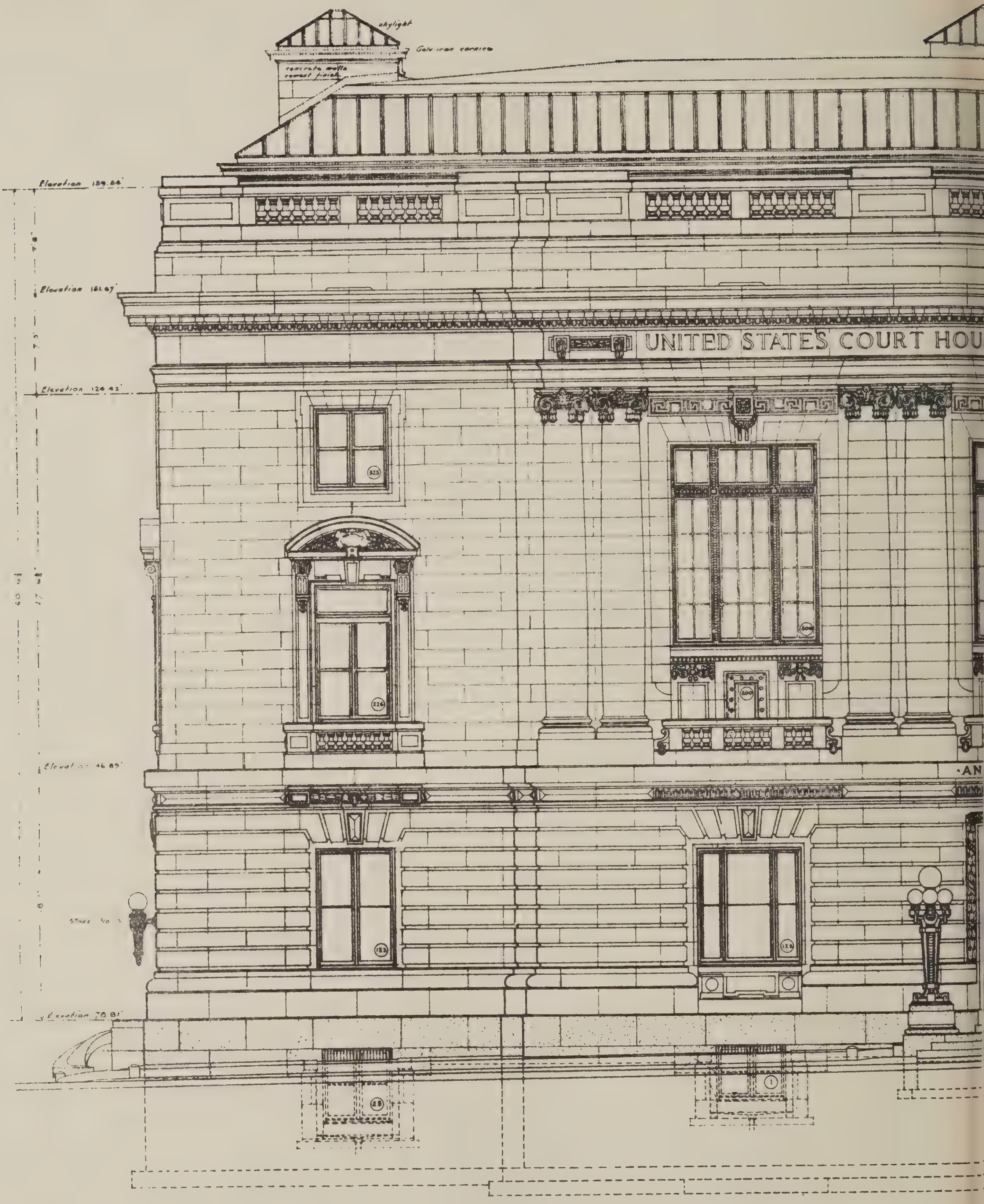
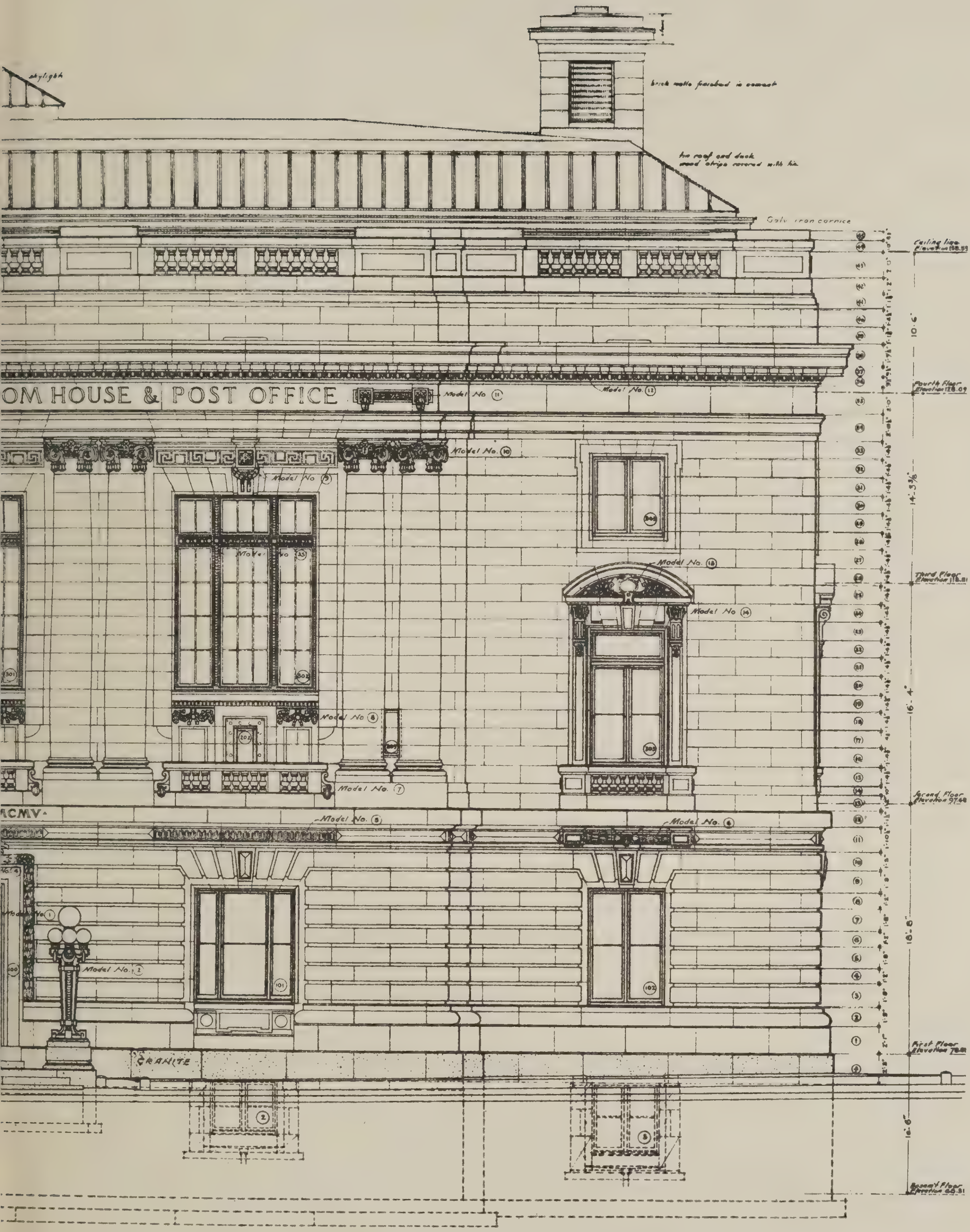
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, January 25th, 1905.



UNITED STATES COURT HOUSE, CUSTOM HOUSE



E, WHEELING, W. VA.   MARSH & PETER, ARCHITECTS.

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R.I.B.A.

Prizes and Studentships; European Architecture in India.

A MEETING of the Royal Institute of British Architects was held at 9, Con- it Street, W., on Monday evening, the iir being occupied by Mr. T. E. Collcutt. Mr. Graham, hon. secretary, referred to e death of Mr. Thomas Blashill in feeling ms, and a vote of condolence with the atives was passed, Mr. William Woodward d Mr. E. W. Hudson also testifying to the gh ability of the deceased.

The deed of awards of prizes and student- ips for 1904-5 was announced as follows:—

Silver Medal and 25 Guineas for an essay the development of architectural art from uctural requirements and nature of aterials (14 competitors):—Miss Ethel M. iarles, A.R.I.B.A., of London ("Dil Aram"). ie sum of 10 guineas and a certificate of n. mention was also awarded to Mr. A. omney Green ("Beauty is Truth, Truth auty"), and certificates of hon. mention ere also given to Messrs. J. Jeffrey Waddell Brunelleschi"), J. Murray Kendall Hawk"), Leslie Patrick Abercrombie I Bide My Time"), Walter H. Godfrey Nike Apteros"), Cyril E. Power ("S. lmund, King and Martyr"), and Hugh P. Maule ("Ubique").

Silver Medal and 10 Guineas for measured awings (17 competitors):—Mr. Edward G. ylie, of Glasgow ("Unicus"), for 6 strainers Haddon Hall, Derbyshire. Certificates of on. mention were awarded to Mr. W. Harold illyer ("Thames") for 5 strainers of Somer- t House, and to Mr. Arthur R. H. Jackson evice of a "Red Disk") for 6 strainers of e Pazzi Chapel, Santa Croce, Florence.

Soane Medallion and £100 (for Continental ivel) for the design of a royal palace (12 mpetitors):—Mr. S. Herbert Maw, of Bol- n, Lancs ("Crumpets"). Certificates of hon. ention were awarded to Mr. Robert White ckering ("Benedick") and Mr. W. A. S. ordon (device of a "Lion Rampart").

Owen Jones Studentship (certificate and oo) for travel and study of colour (three mpetitors):—Mr. Harry Morley.

Pugin Studentship (silver medal and £40) r travel in the United Kingdom (seven mpetitors): - Mr. E. Garratt. The sum of guineas and a certificate of hon. mention as awarded to Mr. H. A. Dalrymple.

Godwin Bursary (silver medal and £65) r travel outside the United Kingdom:— r. F. R. Hiorns (the only competitor).

Tite Prize (certificate and £30)—for travel Italy—for the design of an hotel lounge d staircase:—Mr. Robert Atkinson, of ottingham ("Palladio"). The sum of 5 iineas and a certificate of hon. mention to r. Alec. G. Horsnell ("E Angle") and a rtificate of hon. mention to Mr. C. L. right ("Vista").

Arthur Cates Prize (£42)—two competi- rs—Mr. F. Winter Newman. A certificate hon. mention was awarded Mr. Vincent ooper.

Grissell Gold Medal and 10 Guineas (for sign and construction) for the design of a inter garden in iron and glass (five com- titors):—Mr. James A. N. Hunter, of berdeen ("Onward").

Ashpitel Prize of books value £10, given the candidate who passes best in the aminations, was awarded to Mr. C. Lovett ill, of London.

A paper on "European Architecture in lia," illustrated with lantern views, was en read by Mr. James Ransome, F.R.I.B.A., nsulting architect to Government, Calcutta.

Referring to the tendency in recent years India to erect buildings in the styles and on the lines of those found to be suitable in England, Mr. Ransome said he proposed to demonstrate the obstacles which opposed this practice. For although the dearth of good European buildings was undoubtedly largely due to the lack of proper architectural training in their designers, it was at least open to debate whether this deficiency might not be, in an even greater measure, the result of an insistence upon European traditions in the face of climatic opposition.

Except where earthquakes are of frequent occurrence, and in the case of buildings erected immediately after such disturbances, the possibility of their occurrence does not appear to have influenced the construction or designs of buildings; on the contrary, there seems to be a feeling that even the smaller buildings are incomplete without a tower, dome, minaret or turret. Cyclones affect construction rather than design, while dust-storms render it advisable that all apertures ordinarily left open may be closed on occasions. In many districts the prevalence of flies necessitates the addition of gauze shutters to every opening.

A really watertight roof is an unusual luxury in India, and as failure in this respect is attributed to the severity of the rains rather than the inefficiency of the roofs, but little effort has been made towards their improvement. Latterly pitched roofs have come increasingly into use, and though contrary to the traditions of the country, seem likely to survive the prejudices against them. It is something of a surprise to find that sheet-iron, either corrugated or plain, is largely used for roof-coverings in India, since it offers but little resistance to the outside temperature, is very noisy and rarely watertight during the rains, requires constant attention, has no lasting properties, and is always unsightly.

In a country where buildings are rarely to be seen except beneath a brilliant and cloudless sky, the influence of cast shadows calls for greater consideration than in places blessed with less sunshine; hence much of the European work in India appears at its best only on the comparatively rare occasions when the sky is clouded. The native work is often richly inlaid with marbles, stones and tiles, and when carving is employed externally it is usually in low relief. For the most part Indian bricks are of most excellent colour and quality, and susceptible of sufficiently fine treatment. The bricks are rubbed so that their joints are hardly perceptible, and the whole of the face is finely carved. Such work is abundant in many of the native cities, and is still being executed.

Dealing with the temperature of India so far as it affects building designs, the author classified the climate under three headings, viz., that of the Hills, that of the Plains and that of the Coast, describing typical cases of each to convey an idea of the general conditions. The temperature of the Hills tallies so nearly with what we are accustomed to in this country that, so far as heat and cold are concerned, there is no reason why buildings suited to an English climate should not serve their purpose equally well if transplanted to the hills of India.

While the temperature of the Coast may be considered as uniformly hot, that of the Plains, though rising many degrees higher during the hottest days, falls considerably at night, and is some 30 degrees cooler in winter than in summer. Hence it is customary in the Plains to close all apertures and exclude the outside air during the hot days, while around the Coast windows and doors are thrown open all the year round and the windows are frequently left unglazed. In the older buildings these opposite conditions produced a marked difference in the plans of buildings for the Plains and those for the Coast; for whereas the former were, as a rule, compact, with lofty rooms grouped around a large central apartment usually unlit by windows, the plans of buildings for the Coast were extended and arranged so that the rooms had as many outside walls as possible. In the more modern buildings this difference is less marked, for on the one hand the introduction of cooling by evaporation has opened out the plans of buildings for the Plains, while increased cost of building has curtailed the area of those for the Coast. As a rule, however, the older arrangements were more satisfactory, and it is not desirable that the conditions which gave rise to them should be overlooked.

But whether on the coast or inland the comfort of buildings in the plains of India is chiefly dependent upon the extent to which their walls are protected from the rays of the sun. Many of the European buildings are now built without verandahs; but as their omission entails great discomfort, and ultimately results in the disfigurement of the building by various devices for protecting it from the sun, there can be no question as to the necessity for verandahs around the external walls of every habitable room except those facing north. It follows, therefore, that the appearance of an Indian building must necessarily be largely dependent upon the treatment given to its verandahs, and one of the chief difficulties in this connection is that of exposing a sufficient feeling of solidity in a building of which so large a proportion of its main walls must be concealed.

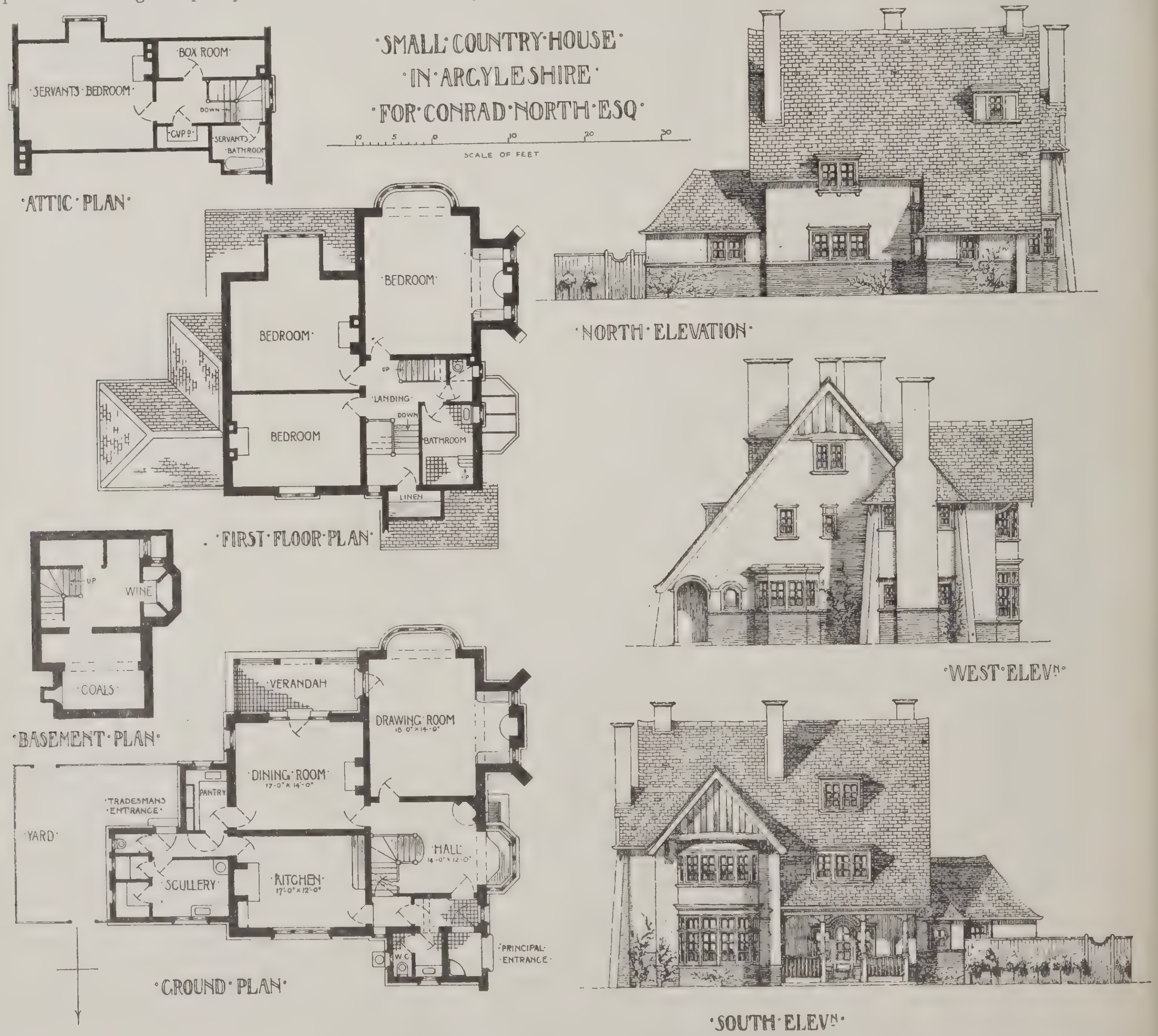
In many of the modern designs for buildings attempts are made to follow the lines of native Indian architecture; as a rule, however, not with very satisfactory results, as they are based upon a too perfunctory study of native work.

Indian architecture may be broadly classified under two heads—Hindu and Saracenic. Instances of satisfactory structural forms are rarely to be met with in Hindu work, which seems never to have shaken itself free of the timber and rock-cut traditions upon which it was based. Yet much of this work is covered with beautiful detail and refined and graceful ornament.

It is strange that such a monument to the power of simplicity as the Taj Mahal should stand in a country so much in need of the lesson it should teach, and the fact that its influence upon the architecture of the country is imperceptible is perhaps even more surprising. Much of its effect is undoubtedly due to the increased play of light and shade, induced by its walls meeting at obtuse angles a form of treatment which might be applied more generally to the walls of verandahs without detriment to their utility, and with some advantage to their appearance; for the excessive accentuation of right angles, produced by the brilliant sunlight of the plains, is not always beneficial to the appearance of a building. A dome is not ordinarily an economic form of roof, and it is not easy to find any useful employment for minarets and the little domed structures with which the roofs of Saracenic buildings are usually decorated, and which play so large a part in their composition. Nor is there much need in European buildings for the finely-pierced stone tracery which was extensively used in the windows and balconies of this style; or for those curious and typical features known as Jhomkes, examples of which are to be found on the gateway of the Taj. On the other hand, the Chujja, or wide projecting slab cornice, which is one of the most characteristic features of Saracenic work, is exactly what is required to shelter clearstory windows and exposed walls. The Kingras, or ornamented battlements, many of which are of very beautiful design, can be introduced effectively in place of the European parapet, while the great variety of form in the Saracenic arches affords sufficient scope for judicions selection. The style is also rich in oriels and balconies, designed in admirable taste and executed with considerable skill.

Law Cases.

Four Workmen's Compensation Appeal Cases.—In the Court of Appeal last week decisions were given in the four workmen's compensation cases of *Aylward* v. *Matthews*, *Fletcher* v. *Hawley*, *Coles* v. *Anderson* and *Hartley* v. *Quick*. The first was an appeal by the employer from an award made by Judge Emden at Lambeth. The applicant for compensation was a labourer employed by Matthews in the erection of a timber gantry supporting a steam crane platform at Salter's Hill Board School extension. On the day of the accident he was working on one of the legs of the gantry (which was then 62ft. high, but the steam engine had not been placed on the platform) and when descending a ladder inside the leg a plank broke on which the ladder stood and he fell and was injured. The school building at the time was not 30ft. in height, the foundations only having been laid. Judge Emden found that the steam crane gantry was a "building" within section 7, sub-section 1, of the Workmen's Compensation Act, 1897, exceeding 30ft. in height; that it was being erected by means of a scaffolding, which was an essential and substantial part of the process of the work; and that Matthews was the undertaker in respect thereof. He accordingly awarded a weekly sum as compensation during incapacity. Matthews appealed. The Court, however, dismissed the appeal. The Master of the Rolls said that the ground of this appeal was that the county-court judge had wrongly found as a fact that a certain wooden structure, which was itself being constructed by means of a scaffolding, was a "building" within the Workmen's Compensation Act, 1897. How could they say as a matter of law that a temporary wooden structure erected for the purpose of carrying a crane was not a "building"? Suppose that a permanent structure were built of brick or stone for the purpose of carrying a crane, it could not be said that it was not a "building" within the Act. The only difference between the two structures was that one was constructed of wood and the other of brick or stone. In his opinion it could not be said as a matter of law that because the structure was made of wood it was not a building. The structure here was capable of being a "building" and the appeal accordingly failed. Lord Justice Mathew was of the same opinion. The argument on behalf of the appellant pointed to this, that a structure to come within the word "building" in the Act must be made of brick or stone. The Act did not, in his opinion, contemplate any such limitation upon the meaning of the word. The structure seemed to him to be the same whether it was constructed of wood or of brick or stone, and it might be a "building" within the Act though only a temporary wooden structure. Lord Justice Cozens-Hardy agreed.—The second case was that of *Fletcher* v. *Hawley*. This was an appeal by the workman, Fletcher, a carpenter, against a decision of Judge Raikes at Barnsley. The facts were as follows:—A shop was being altered into a restaurant. The building owner entered into an agreement with Hawley, a master carpenter, to put up a screen in the shop, and to do other work which did not require any scaffolding. He also contracted with a builder to have a fireplace put in one of the rooms and a new chimney built, which did require scaffolding. While Fletcher was punching a nail into the screen, part of the punch flew off into his eye, and caused very serious injury. The county-court judge held that as the Act only applied to buildings being repaired by means of a scaffold, Hawley was not an undertaker within the Act, because for his job no scaffolding was necessary and the workman could not claim compensation from him. He, therefore, refused to make an award in his favour. The workman appealed. The Court allowed the appeal. The Master of the Rolls said it appeared that Fletcher availed himself of the builder's scaffolding to a certain extent. The county-court judge held that, in order that the injured workman might recover compensation, it was necessary that the scaffolding should have been put up



EWART G. WALKER, ARCHITECT.

In this design an endeavour has been made to introduce conveniences in accommodation usually associated only with much larger houses. The exterior walls above the ground-floor window-sills are rendered with coarse rough-cast of granite chips, lime-whitened, being faced below the sills with special warm-coloured red bricks. The roofs are tiled and all external woodwork is painted green. The verandah, vestibule and ground-floor lavatory are paved with red paving quarries. The sunk bath on the first floor is constructed of steel joists and concrete, and is lined with white glazed tiles.

by the undertaker from whom compensation was claimed. At first sight it might appear that there was something to be said in favour of this view. But it had been expressly decided that there might be more than one undertaker to the same building, and when that was once accepted it seemed to him that the whole position contended for by the applicant was carried. The Act required that there should be a scaffolding by means of which the building was being repaired, but there was no provision that the scaffolding should have been put up by the undertaker from whom compensation was claimed. The existence of a scaffolding was necessary, but if there were more than one undertaker it was not necessary that the scaffolding should have been put up by the undertaker in whose employment the injured workman was. The fact that the injured man made some use of the scaffolding seemed to put this case on all-fours with *Mason* v. *A. R. Dean, Ltd.* The appeal was therefore allowed, and the applicant held to be entitled to an award of compensation. The Lords Justices delivered judgment to the same effect. - The third case, that of *Coles* v. *Anderson*, was an appeal from an award of the judge of the Shoreditch County Court in an arbitration under the Act. The facts were as follows:—A private owner had built a house and had made a drain for it, which required to be connected with the main sewer. The local authority had, in the interests of the public, entered into an arrangement by which the work of connecting the drains of private houses with the main sewer should be carried out by their contractor. The owner had brought the drain up to the edge of the footway in front of his house—that was to say, to the point where the work of the local authority's contractor was to begin. The deceased workman was in the employment of the contractor, and at the time of the accident he was engaged in making a trench in which a pipe was to be laid by which the private drain was to have access to the public sewer. The trench had not then reached the sewer, nor had the sewer been touched, but the object of making the trench was to connect the drain with the sewer. The county-court judge held that, as a matter of law, the employment on which the deceased was engaged was not on or in or about engineering work. (The Act, by sub-section 2 of section 7, defines "engineering work" as being "any work of construction or alteration or repair of" *(inter alia)* "a sewer." And it also, by sub-section 1 of the same section, enacts that its provisions should apply to "employment on or in or about engineering work.") The county-court judge made an award in favour of the respondent, with costs; but he ordered a stay of execution pending an appeal. The Court allowed the appeal. The Master of the Rolls said in his opinion "engineering" work included work done for the purpose of obtaining access to the sewer as well as the actual work of making the alteration in the sewer. The county-court judge divided the work into two parts; he separated the work of obtaining access to the sewer from the work of actually altering the sewer. But all the work had for its object the connecting of the private drain with the public sewer. In his opinion the county-court judge had misdirected himself by narrowing the meaning of engineering work and by not including in it the antecedent ancillary work which was necessary for performing the actual work of alteration. The Lords Justices delivered judgment to the same effect.—The fourth case was that of *Hartley* v. *Quick.* This was an appeal by the employer from an award made by Judge Gye at Portsmouth. The applicant for compensation was a workman in the employment of Quick, who was a builder and contractor engaged in erecting an extension to the corporation electricity generating station at Portsmouth. The workman was injured by falling off the scaffold while carrying up materials. At the time of the accident the walls of the new building had been carried up in places to about 20ft., but they were not anywhere connected with the station, though the footings for the extension were in absolute touch with the wall of the existing building. The county-court judge said the question seemed to be—under what circumstances could a building less than 30ft. high adjoining a building more than 30ft. high be a "building which exceeds 30ft. in height"? In his opinion, if the two buildings were intended ultimately to form one building, or to form two buildings to both of which an existing party or other wall either was or was intended to be common, absolute physical attachment of the new to the old building was not necessary so long as the building operations were being carried on in connection with and having regard to both buildings. He accordingly held that the applicant's employment came within the Act, and he awarded him 12s. 6d. a week. The employer appealed. The Court dismissed the appeal. The Master of the Rolls said, however, that if it were the case of an independent owner constructing an independent building, even though it involved the use of the party-wall of the existing building, he should have doubts whether the employment would be about a building exceeding 30ft. in height. Lord Justice Cozens-Hardy was of the same opinion, observing that if the present case had been that of an owner building on his own land, intending merely to make such use of his neighbour's wall as a party-wall as the law allowed, he could not have agreed with the conclusion arrived at by the county-court judge. He could not have agreed that the wall, which might have been used afterwards as a party-wall, could be said to be, at the date of the accident, the wall of a building 30ft. in height which was being constructed or repaired.

Architect's Fees for Arbitration.—In the King's Bench Division of the High Court on Wednesday Mr. William Theobalds, architect and surveyor, Budge Row, London, sued Mr. Charles Clements, a builder, of Henley-on-Thames, for £102, fees for professional services rendered. It appeared that in connection with an arbitration the plaintiff was engaged, firstly, as a surveyor for the defendant, and afterwards as the arbitrator. The defendant, it was contended by the plaintiff, agreed to pay 7 guineas a day for his own services and 2 guineas a day for those of his assistant when engaged on office work, with 10 guineas and 3 guineas a day respectively when a visit to Henley took place. The defendant denied that there was any agreement to pay the fees named, characterized them as extravagant, and urged that no such agreement should be upheld in a court of law, as it was contrary to public policy that an arbitrator should be paid to act as an advocate. The jury intervened while the defendant was giving evidence, and found for him on the ground that there was no special agreement for the payment of the fees. The judge intimated his agreement with the jury's view, and stated that in any case he would have entered judgment for the defendant, the alleged special arrangement being foreign to the Arbitration Act. Judgment was accordingly entered for the defendant, with costs.

Architects' Offices and Interference with Light.—On Friday last Mr. Justice Bray gave judgment in the case of *Ambler* v. *The Bishop of Leeds* (reported on p. 35 of our issue for last week). This raised a point upon a special case stated by an umpire relating to a finding in respect to the interference with the light of premises used by an architect. It was contended by the plaintiff that his light was obstructed by the erection of the Roman Catholic Cathedral on the opposite side of Cookridge Street, Leeds, and, in consequence, that he was entitled to damages. Plaintiff was the owner of premises on the first floor of which he carried on his business as an architect, and he claimed that the erection of the defendant's cathedral was an interference with his ancient lights. Mr. Justice Bray, following the decision in the House of Lords in *Home and Colonial Stores* v. *Colls*, held that the plaintiff was not entitled to any damages. Judgment was therefore entered for the defendant, with costs.

COST OF OVERHEAD TRAMWAYS.

IN the course of a paper on "Tramway Overhead Equipment Materials" read before the Tramways and Light Railways Association recently Mr. H. M. Sayers said the cost of overhead work varied a good deal more than it should. Some authorities put it at £1,500 to £2,000 per mile of route, but he did not know how so much could be properly spent. Good work for either double or single lines could be erected for £1,200 per mile with fair profit to the contractor. Bracket-arm work for single lines, where a single line of poles was generally sufficient, could be done for £1,000 per mile, or even less under favourable conditions. These rates included average amounts of guard wiring and a proportion of junctions, but heavy and complex junctions and special requirements would involve some additional expense. A great deal of money could be spent on elaborate scrollwork and fancy painting, especially if a little gold leaf was thought necessary to harmonize with the surroundings, but these were matters of taste rather than engineering, and those who liked to pay for them would doubtless continue to do so. On the question of poles Mr. Sayers said that wood was extensively employed in the United States and some Continental countries. Very thick timber was necessary, and the poles had a heavy and stumpy appearance. The first cost was generally lower than that for steel poles, but the ultimate economy was doubtful. Lattice poles could be purchased, and were said to be cheaper than tubular poles of equal strength; but they were very ugly, and it was probable that the painting necessary to preserve them from rapid corrosion would neutralize the initial saving.

HISTORIC CITY BUILDINGS.

HISTORIC buildings in the City of London formed the subject of a paper, illustrated with lantern slides, which Mr. T. R. Croger read before the Society of Architects last Thursday. In referring to the thirteenth-century building of St. Etheldreda's Church in Ely Place he explained that it had an under croft and an upper croft, and was a rare example of a structure representing one church built on the top of another. In Queen Elizabeth's reign the building was placed in secular hands, being subsequently rented by a Welsh Presbyterian sect, and in about 1864 was put up to public auction and bought by Roman Catholics, who had worshipped there ever since. Among other churches dealt with by the lecturer was St. Bartholomew's, Smithfield, the transept of which was up to a recent time occupied by a smithy and one end of the building by a loom. This church was restored by Sir Aston Webb. The Lady Chapel of St. Saviour's, Southwark—a beautiful piece of pure Pointed architecture—was also shown. No one could say, the lecturer stated, why it was called a lady chapel. There was no evidence that it was ever so used. The little edifice narrowly escaped demolition when new London Bridge was built. It was condemned as being an obstruction to the newly-designed approach, but local opposition proved too much for the City Fathers, and the building was spared from the fate that befell the houses immediately adjacent. Other places of interest shown upon the screen and described by the lecturer were the Tower; the Dutch Church, Austin Friars; St. Olave, Hart Street; St. Helen, Bishopsgate; Crosby Hall; St. John, Clerkenwell; the Temple Church, and Canonbury Tower.

Keystones.

Mr. Joseph Pennell is going back to America for good.

The Year-Book of the Society of Architects has just been published, price 2s.

The Annual Dinner of the Surveyors' Institution will be held at the Hotel Great Central on Wednesday, March 1st, at 7 p.m.

The Priory Church of Holy Trinity, York, a very ancient building, is now undergoing restoration at a cost of £5,360 under the direction of Mr. C. Hodgson Fowler, of Durham.

The International Archæological Congress at Athens will be opened by the Crown Prince of Greece on April 7th, and will last a week. The opening meeting will be held in the Parthenon.

A Water Tower.—The Boston Waterworks Co. have decided to erect a water tower for 43,000 gallons. It will be 60ft. high, of brick, and the tank 37ft. 6ins. by 41ft. 6ins. by 4ft. 9ins. The total cost will be about £2,000.

A new Church and School at Staveley, Sheffield, has been erected for the Primitive Methodists at a cost of £2,000, from designs by Messrs. W. J. Morley & Son, of Bradford and London. Messrs. T. Lee & Son, of Staveley, were the builders.

The Auld Brig o' Ayr.—At last week's meeting of the Ayr Town Council it was remitted to the Old Bridge Committee, together with John Eaglesham, Mr. J. A. Morris and the surveyor, to report as to the best way of carrying out the work of rebuilding the bridge.

"**Old Houses in Edinburgh**" form the subject of some drawings by Mr. Bruce J. Home, which are now being issued by Mr. W. J. Hay at John Knox's House in Edinburgh and by Messrs. Samuel Bagster & Sons, Ltd., London, price 1s. each part. Prof. G. Baldwin Brown writes an introduction. In the first number there are three plates.

Sunderland's Municipal Buildings.—The foundation-stones of the new quarter sessions court, police buildings and fire-station at Sunderland were laid on Wednesday last. Messrs. Wills & Anderson, of London, and Messrs. W. & T. R. Milburn, of Sunderland, are the joint architects, and Mr. J. W. White, of Sunderland, is the builder. The buildings will cost £40,000.

The King's Sanatorium: Progress of the Work.—The east and west wings of the King Edward VII. sanatorium at Midhurst (Mr. H. Percy Adams, F.R.I.B.A., architect) are now roofed in, and the plastering is being done, while the main part of the central patients' block has reached second-floor level. The foundations for the chapel are being put in. The administration block is partly roofed in and up to first-floor level, while the laundry is being prepared for the reception of the machinery. Up to the present there has been delivered on the works 3½ million bricks, with sand, lime and cement in proportion, and considerably over 4,000 yds. of concrete. About 180 men are engaged, and this number will be increased as the work proceeds. It is hoped that the sanatorium will be completed before the end of the year.

A Competition for New Baths and Washhouses at Hammersmith, to be built at a cost of about £50,000 next to the proposed new technical school, is to be held among the following selected architects:—Mr. A. W. S. Cross, Mr. J. Ernest Franck, Mr. Maurice B. Adams, Mr. E. Harding Payne, Mr. J. R. Moss, and Messrs. H. & R. H. Spalding.

Sir Caspar Purdon Clarke, C.I.E., F.R.I.B.A., director of the Victoria and Albert Museum, South Kensington, is going to New York as director of the Metropolitan Museum. This implies the termination of about twenty-five years' service at South Kensington, commencing with the organization of the magnificent collections of Indian art—the finest museum of its kind in Europe.

Quantity Surveying, Past and Present.—In the course of a paper on this subject which he delivered before the Edinburgh Building Trades' Exchange on Thursday, Mr. W. Carrick said that, while the rules of measurement now current in Edinburgh were the outcome of the labours of representative committees, they were capable of amendment, and he expressed the hope that this might be brought about soon.

Partnership.—Mr. James Williams, of 11, Carteret Street, Queen Anne's Gate, S.W., has taken into partnership Mr. Edward L. Wratten, A.R.I.B.A., and the name of the firm will in future be Messrs. Williams & Wratten. Mr. James Williams was formerly partner with the late Mr. George Devey, of Bond Street, W., and afterwards carried on business at Victoria Street, but has now been for some years at the above address in Queen Anne's Gate.

The British Hospital at Constantinople, of which Mr. H. Percy Adams, F.R.I.B.A., of London, is the architect, was opened last week. It has cost about £35,000 and accommodates fifty patients. It is built mainly of stone from Sevastopol, though Messrs. Doulton, of Lambeth, have supplied much of the material. The fitting and furnishing has been carried out by firms in England. By the Sultan's permission, all the materials required in the construction of the building were allowed to pass into Constantinople free of Customs duty. The builder was a Greek, and his workmen were Turks and Armenians.

Acton Isolation Hospital was opened last Wednesday. It has been erected by the district council, at a cost of about £15,000, on the site of the buildings known as "The Friars" in Wales Farm Road. On the south is an observation block, and on the north are scarlet fever and diphtheria and enteric wards; also a laundry, disinfector, van sheds, mortuary, &c. The hospital provides accommodation for thirty-three beds, five in the observation ward and fourteen in each of the other two buildings. The whole is lighted by electricity. Mr. D. J. Ebbetts (surveyor to the council) was the architect of the hospital.

A Note on Skyscrapers.—In his recent paper on the visit paid to the United States and Canada last year by the Institution of Civil Engineers, Sir William White said the spectacle of the skyscrapers from the harbour of New York was remarkable and interesting, but, in spite of their advantages in concentrating business, he personally was not desirous of seeing a similar group of buildings in any city of Great Britain. In Chicago, the birthplace of the skyscraper, a law had been passed limiting the height of new buildings to 150ft., and that example would probably be followed elsewhere. In New York, south of 59th Street, there were 250 buildings of ten storeys or more, which had cost on an average £200,000 each, some of the largest representing £700,000 to £800,000 each.

Royal Academy Exhibition, 1905.—The day for receiving architectural works is Friday, March 24th, between 7 a.m. and 10 p.m.

Crieff Cottage Hospital Competition.—Out of fourteen designs submitted for this hospital, that by Mr. E. C. H. Maidman, of Edinburgh, has been adopted.

For a new Elementary School at Northwich the design of Mr. Alfred Powles, of Northwich, has been accepted in limited competition. The school will cost about £10,500.

"**One and All Gardening, 1905**" (just published from 92, Long Acre, W.C.), is wonderful value for 2d. There are 200 pages, with about 150 illustrations. The first edition is of 100,000 copies.

The Valuation Bill, 1904.—A penny pamphlet on this Bill has just been issued from Mr. S. Egecumbe-Rogers, of 27A, Farringdon Street, E.C. It is a reprint of a series of articles by an expert which appeared in the "Local Government Journal."

Edinburgh Architectural Association.—At last week's meeting—Mr. H. O. Tarbolton presiding—a paper on "The Electric Lighting of a Country House" was read by Mr. Mathew Buchan. He pointed out that practically the only difference in the lighting of a town and a country house was in the method of supply. In the town they were supplied with a current from the public supply, whereas in the country a supply had to be made on the estate. Dealing with the interior of the house, he showed the different systems of tubing and wiring, and strongly advocated the "draw-in" metal tube system.

Strand Improvement Scheme: Influential Protest.—A memorial signed by the President of the Royal Academy and a number of other distinguished painters, sculptors and architects (the last-named including Sir Aston Webb, Mr. G. F. Bodley, Mr. R. Norman Shaw, Mr. Ernest Newton, Mr. John Belcher, Prof. Beresford Pite, Mr. Basil Champneys, Mr. Reginald Blomfield, Mr. Henry T. Hare, Mr. C. F. A. Voysey and Mr. Mark H. Judge) is to be presented to the London County Council expressing the opinion that the frontage-line now proposed will have a bad effect, and hoping that the Council will yet adopt some plan showing better consideration for the churches of St. Mary-le-Strand and St. Clement Danes. Protest is also made against the height of the buildings already begun, and the hope is expressed that on the rest of the frontage the new buildings may not be so lofty as to overpower the two churches and Somerset House, "which are and should remain the principal ornaments of the Strand."

The Education of the Architect.—At last week's meeting of the Glasgow Architectural Association a paper on this subject was read by Prof. Eugene Bourdon, B.A., A.D.F.G. Mr. John Keppie, I.A., F.R.I.B.A., president of the Glasgow Institute of Architects, presided. Professor Bourdon said that it was only by assisting a good practical architect that the pupil could profit by the theoretical tuition that was imparted to him in school. Without any practice the pupil might become a good draughtsman, an able calculator, but he could never be truly an architect. Still there was a necessity for schools. Architecture must be taught in all its branches in a school of architecture. School and office training were both necessary, and the question was how to divide a young man's time between school and office. He suggested a four years' course at a day school of architecture, or, where students were unable to attend such a school, they might go to evening classes and in seven years cover pretty nearly the same ground as a student in the four years' course at a day school.

FOLDING OR SLIDING DOORS.

THE advantages of double doors between two large rooms are beyond question, but it often occurs that folding doors are a great inconvenience, as they must of necessity have projecting hinges, sufficient to clear architraves or pilasters, as the case may be, and the strain on these is so great that the doors invariably drop and drag on the floor or carpet; moreover, when folded back they are apt to destroy the uniformity of the room.

To obviate this inconvenience and unsightliness, I venture to offer an alternative, as well as a contrivance for opening and closing the doors simultaneously.

At a suitable height two chases are formed $4\frac{1}{2}$ins. wide and 3ins. longer than each door, exactly in line with each other (see Fig. 1), and two or three steel joists or lintels are fixed, of section and strength corresponding to the width of opening and what they have to carry. Fig. 2 shows the gearing with doors closed. Figs. 3 and 4 show the middle hanger, also the gearing with the doors about 1ft. apart. The middle hanger is different to the others in one respect only—it has to carry the centre wheel which is worked by the "rack" bars, reverse in action.

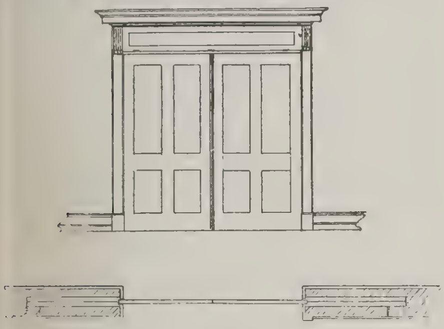


FIG. 1.

The steel "rack" bar is fixed to one door with a special twisted strap, and the other is secured to the friction-roller case with set-screws. The steel running bar is fixed at both ends and to as many hangers as necessary, about 2ft. 6ins. apart, perfectly level and rigid and the hangers bolted to the lintels.

After the gearing has been fitted to the doors on the bench, pack up the doors in their places in the opening, then fix the gearing and insert the centre wheel with the doors closed. Put friction rollers to each door as guides at the bottom (Fig. 5), and fix a metal guide in an oak sill in each chase for the length of the doors only; the ends near the opening must be pointed so as to avoid trouble in steering the roller on the closing stile when pushing the doors into the chase.

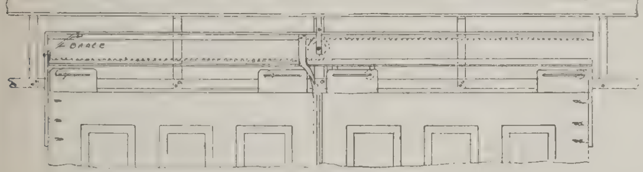


FIG. 2.

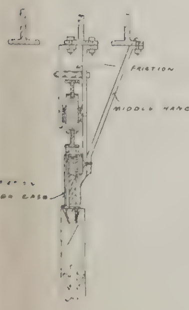


FIG. 3.

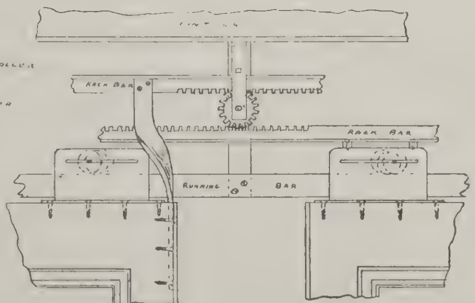


FIG. 4.

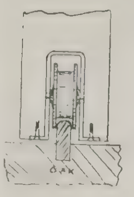


FIG. 5.

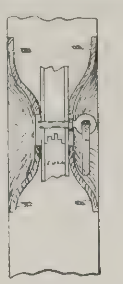


FIG 6.

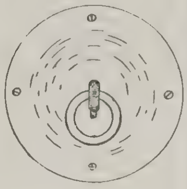


FIG. 7.

A hook single-bolt mortice lock specially adapted to sliding doors is required with flush cups and key with ring to same (Figs. 6 and 7); also flush sash lifts let in the door stiles above the lock and one drop flush hook let in the edge of each door. The meeting edges of the doors can be grooved and tongued or rounded and hollowed to taste; a rounded edge would be best for shaping the face of the lock to same. Put $1\frac{1}{2}$in. indiarubber door stops as buffers on the back edge, top and bottom, of each door, with oak sill and metal guides, leaving an opening behind the skirting at the end of the chase; for fixing same the frieze panel to be hung to the soffit lining so as to give access to the gearing, which may require adjustment and lubrication.

There is an alternative to the "rack" bars, to which objection may be raised on the score of noise, which is, to provide steel flexible wire cords acting on a sheath pulley instead of the cog wheel. The reversing action will be similar, but one cord must work around the pulley from the top and the other from the bottom; the cords must also have a tightening screw through the guide bar on the back edge of the doors, and the sheath pulley must have two grooves, each cord working in its own groove. The doors can be framed and moulded to suit any design, with pilasters, frieze and cornice; they can have silvered plate glass on one or both sides, in which case the inside of the chases will need to be rendered smooth in Parian cement about 18ins. from the lining and distempered black to avoid reflecting rough work when the doors are half open.

WILLIAM MIDDLETON, A.B.I.C.C.

UNIVERSITY COLLEGE SCHOOLS.

IN the council room of University College, Gower Street, London, Mr. Paul Waterhouse's design for the new medical school has been on exhibition during the past week, together with the five competitive designs for the new buildings of University College School at Hampstead.

The new medical school is to be erected in University Street, facing the Hospital. Funds for the erection of the school have been generously given by Sir Donald Currie. The elevation is dignified. It is classic in treatment, and comprises a podium of stone with a pedimented centre block having columns on each side and wings to right and left similarly treated. In the basement will be a gymnasium, theatre, lecturers' room, &c.; on the ground floor, dining- and sitting-rooms to the right and a library to the left (extending two floors up); on the first floor a pathological theatre, laboratories and bed- and sitting-rooms; on the second floor a museum in the left wing (extending to the third floor), a practical classroom for chemical work and research, bacteriology theatre, and more bedrooms in the right wing; the third floor being occupied by demonstration and experimental rooms and bedrooms.

For the new school at Hampstead Mr. Arnold Mitchell, Mr. Henry T. Hare, Mr. Paul Waterhouse, Mr. H. Chatfeild Clarke and Prof. F. M. Simpson were invited to submit designs The selected design, by Mr. Arnold Mitchell, shows a school planned in three blocks connected by covered ways, but treated as an architectural whole. The central block is entirely occupied by the central hall (96ft. by 47ft.) and the classrooms ranged around it, each of which is lighted from the left and has at least one window carried up to the ceiling. On the ground floor there are ten classrooms and on the first floor fourteen, each 23ft. 6ins. square, with an area of at least 18ft. super. per scholar. To the left of the central block is a wing comprising the dining hall (60ft. by 56ft., on the first floor, with accommodation for 300 boys) and service department, while the wing on the right is devoted to science and art rooms. The roof of the central hall is pitched high and flanked by two cistern-room turrets. There are no corridors in the main teaching block, all the classrooms opening direct from the hall, thus securing economy of space and good supervision. The school is proposed to be carried out in brick, and at 1s. per cubic foot is estimated to cost £58,411, including £500 for gravelling playgrounds, £500 for ventilating fans, &c., £1,000 for hot-water heating, £1,750 for water-closet buildings, £1,000 for four covered fives-courts and £4,000 for boundary walls and fences.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Sewage Scheme for Rural District Council.

THAME.—SPRINKLER writes: "A sewerage and disposal scheme for a small township of about 12,000 inhabitants will shortly be receiving attention by a district council. Which would be the cheapest scheme to adopt: (*a*) a septic tank and double contact, or (*b*) a septic tank and continuous filtration with the aid of a revolving sprinkler? Can you suggest a cheaper system which would comply with the requirements of the Local Government Board? It will not be practicable to treat the sewage upon land, as the gradients of the proposed site are too steep. Is there a book published giving examples of conditions of contracts applicable to engineering works?"

The comparative cost depends to a large extent on local conditions, but the expert evidence given before the Royal Commission on Sewage Disposal goes far to prove the *necessity* of the septic tank for small disposal works. Either the double contact or continuous filtration would be suitable for after-treatment; but the cost of the sprinkler apparatus would probably make the latter method dearer. Moreover with the small population named it is doubtful whether the normal flow would be sufficient to work the apparatus. Much useful information is given on questions of sewage-disposal in "The Sewage Problem, a Review of the Evidence collected by the Royal Commission on Sewage Disposal," by A. J. Martin, A.M.I.C.E., &c. (8s. 6d. post free from these offices). Though the Royal Commissioners have not yet presented their report upon this evidence, the expert evidence and experience is exceedingly valuable, and is so arranged as to be easily understood. A good set of conditions of contract for engineering works appears on page 199 of "Specification No. 6, 1903" (2s. 6d. nett, 3s. post free from these offices). All these matters will be fully dealt with in "The Municipal Engineers' Specification," the first number of which will be issued shortly from our offices at the same price as "Specification." Both publications are issued annually.

Dilapidations: Surveyors' Fees.

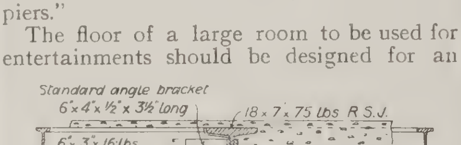
LONDON.—LESSEE writes: "After a notice and schedule have been served on a lessee to repair premises in accordance with covenants, and the work has been executed in accordance with the schedule, application is made for surveyor's fees in preparing schedule, &c., the amount of which was stated in the notice. The lessee writes in reply to such application for fees as follows: 'I have to say that I have already read the sub-sections of the Act you mention—The Conveyancing and Law of Property Act, 1892, 55 & 56 Vict., c. 13, section 2, sub-section 1—in fact it is the same authority as I take myself, but it seems to me that you have not given the subject the thought necessary to get at its proper meaning. If you read carefully you will see that the first part can only be acted upon after the latter part has come to pass. This has not happened, as I have not been relieved by the court. So that you see the whole thing hinges upon that word "relieved." You are also in it referred to the Act (same name) 1881. You will find it section 14, sub-section 1, and after reading that I will bring to your notice the following ruling in a case that was fought out and for which I give you particulars so that you may disprove it if you can. *Nind* v. *Nineteenth Century Building Society* (1894, 2 Q.B., 226). Lord Esher, M.R., and Davey, L.J. A lessee who has complied with a notice under section 14, sub-section 1, of the Conveyancing and Law of Property Act, 1881, to remedy a breach of covenant has not been "relieved" so as to be liable to an action under section 2, sub-section 1, of the Conveyancing and Law of Property Act, 1892, for costs and expenses in reference to such breach, "relieved" in that sub-section meaning relieved by the court. But so far as the fees of the solicitor and surveyor are concerned it has been decided that this provision only applies where the lessee is actually relieved by the court under sub-section 2 of section 14 of the Act of 1881, and not to the case where by complying with the notice under sub section 1 he prevents all rights of forfeiture from becoming enforceable.' Is the lessee correct?"

Under the circumstances mentioned, viz., that upon receipt of the schedule of dilapidations the lessee immediately executed the repairs in accordance therewith, I am of opinion that costs cannot be enforced against him. The lessor's surveyor was, however, correctly following the usual practice when including the amount of costs in the claim, as in case of proceedings for forfeiture the incidence of such fees would be in the discretion of the court. It is worthy of note that in the above quotation from the 1892 Act the important words, "in reference to any breach giving rise to a right of re-entry or forfeiture which at the request of the lessee is waived by the lessor by writing under his hand, or from which the lessee is relieved," &c., are omitted. If the circumstances mentioned have occurred in this case the lessor can recover his costs. With regard also to the quoted case, *Nind* v. *Nineteenth Century Building Society*, your correspondent omits the vital point of the decision, viz., that the action failed because the defendant was only a sub-lessee. You will find in the "Professional Notes" of the Surveyors' Institution, Vol. VI., p. 499, a report of the trial in the Divisional Court (when the costs were awarded to the lessor), and in Vol. VII., p. 70, the judgment of the Court of Appeal, reversing the decision of the lower court upon the grounds that "an under-lessee is not as between himself and the original lessor a 'lessee' within the meaning of the Conveyancing and Law of Property Act, 1892, section 2, sub-section 1, and therefore such lessor cannot recover from him the costs and expenses mentioned in that sub-section." Should you have access to the "Transactions" of the Surveyors' Institution, you will find a very interesting paper on this subject in Vol. XXV. (1892-3); reference to pages 332 and 333 will show the state of chaos in which this particular point stands at the present time.

F. S. I.

Rolled Joists and Concrete Floor.

HULL.—CONSTANT READER writes: "I send a sketch of a concrete floor which I propose to put in to a building. Do you consider it a safe and good method of construction? The room is 25ft. span, and is to serve as a reading-room and for entertainments. The main girders are 14ins. by 6ins., spaced 9ft. 4ins. apart, and the cross-girders 6ins. by 5ins, spaced 4ft. apart and filled in with good concrete. The walls are 14ins. thick, with piers."



The floor of a large room to be used for entertainments should be designed for an external load of $1\frac{1}{2}$ cwts. per ft. super. besides the structural load of $\frac{3}{4}$ cwt. per ft. super. In the present case, with a span of 25ft. and main girders 9ft. 4ins. apart, cross-girders 4ft. apart and concrete 7ins. deep, the structural load on each main girder will be $25 \times 9\frac{1}{3} (1\frac{1}{2} + \frac{3}{4}) \div 20 = 26\frac{1}{4}$ tons distributed. This will require a rolled steel joist 18ins. by 7ins. by 75 lbs. per ft. run. The cross-girders, being 9ft. 4ins. span and 4ft. apart, will have to carry $9\frac{1}{3} \times 4 (1\frac{1}{2} + \frac{3}{4}) \div 20 = 4\frac{1}{5}$ tons distributed, for which rolled steel joists 6ins. by 3ins. by 16 lbs. per ft. run will be suitable, and the whole arrangement will be as illustrated above.

HENRY ADAMS.

Cottages on a Building Estate.

NORTHWOOD.—C. N. writes: "A built two houses on an estate facing a road. Later, B came along and bought a vacant space at the corner of the road (but not from the original vendor) and also three of a row of cottages facing the adjoining street: and he now proposes to cut off part of the gardens of these three cottages bought by him, and to erect two houses next A, thereby blocking the view of the country from the windows on the flank wall of one of A's cottages, which could not be shut out if the plots were used as laid out in the first instance. Has B a right to do this? Can B, in extending the row of cottages, build up to th street boundary?"

However unpleasant his proceedings may be to his neighbours, (1) B is quite withi his legal rights in building the houses a sketched in your plan; unless it can be prove that the original vendor, when cutting u the estate, made such "Building Regulations" as prohibited the subsequent use o any of his land in the manner now proposed A (being one of the original purchasers would be able, by reference to his deeds, t say whether this was the case or not. (2) is also within his rights in extending his row of cottages to the full extent of his land unless it can be shown that a "building line" was laid down in street E by the origina vendor, and that the various plots were sol subject thereto. (3) Of course B's plan will fall to the ground should he not b allowing sufficient air-space in the rear o his new houses to comply with the loca by-laws, but this contingency is, I think, remote one.

F. S. I.

Book on Nonconformist Architecture.

Referring to the enquiry on p. 19 of ou issue for January 11th, Mr. R. M. McDowall architect, of Castleford, writes: "Th book your correspondent enquires about i 'Churches, Mission Halls and Schools fo Nonconformists,' by Messrs. Crouch & Butle architects, of Birmingham, published a 4s. 6d. nett by Messrs. Buckler & Webb, o Church Street, Birmingham. It is ver suggestive in the way of plans."

"Light" Cases.

MANCHESTER.—W. S. writes: "Where ca I find full particulars of the most recent an important decisions in right of light cases?"

See the reports in our own columns; als "The Architects' Law Reports," price 5s. (re viewed on p. 13 of our issue for January 4th

Kitchen below Ground-level.

TUNSTALL.—SUBSCRIBER writes: "It i proposed to build a kitchen on one side o an old wall. The ground on the other sid will be 3ft. above the kitchen floor. T keep the place dry I propose to insert damp-course above the ground-level, and t float the wall inside with neat cement in stead of the ordinary plaster floating, an then to skim the whole over, as usual, wit plaster skimming. Would this method kee the kitchen dry, and would the ceme perish the plaster skimming? Would Keene cement be suitable?"

The ground should be dug away from th wall and the vertical damp-course put o that side in mastic asphalt. Ceme plastering would not then be necessary. moisture is allowed to penetrate the ol wall, as you propose, the plastering, wheth it be in cement or not, would probably co off. Plaster will adhere to cement if t surface of the latter is roughened so as give a key.

Cement in Concrete Floor.

ENQUIRER writes: "Please state wh amount of cement should be used in layi a concrete floor 3ins. thick in the followi proportions:—$2\frac{1}{2}$ parts whin gravel, 1 part Portland cement and 1 part of sand. there any data published on the subject?"

For memoranda of this kind you shou consult "Specification" (price 3s. 3d. p free from our offices). It is easy to calcula the amount of cement required. 1 sq. ft. the floor equals $\frac{1}{4}$ cub. ft. of concrete. diminution of bulk varying from 20 to p r cent. takes place when the whole of t materials composing the concrete are mix together, wetted and finally rammed in position. This means that for every cub. ft. finished concrete $1\frac{1}{3}$ cub. ft. of materials w be required, and as $\frac{2}{9}$ths is cement, $\frac{2}{9}$ths sa and $\frac{5}{9}$ths whin gravel, the quantity cement required per ft. super. will be $\frac{4}{3} \times \frac{1}{4}$ $\frac{2}{9} = \frac{2}{27}$ cub. ft., or $\frac{2}{3}$ cub. ft. per sq. yd.

Builders' Notes.

A new Reservoir for Skipton is to be onstructed at Embasay Moor at a cost of '70,000. Storage will be provided for 20,000,000 gallons.

Bath Master-Builders' Association.—Mr. red J Blackmore has been elected president or the current year, with Mr. William Webb s vice-president. The annual dinner is to e held on February 14th.

Employment in the Building Trade in December is reported by the Board of Trade o have been dull—rather worse than in November, and much worse than a year ago. The percentage of unemployed trade-union members among carpenters and joiners was 1·5 at the end of December, compared with 0·1 at the end of November and 7·9 a year go. The percentage for plumbers was 10·0 t the end of December, compared with 10·2 t the end of November and 7·7 a year ago.

A Congress of the Royal Institute of Public Health is to be held in London from July 9th to 25th. There will be nine sections, ncluding one on engineering and building onstruction (municipal and educational). An exhibition of sanitary appliances, &c., will be held in the Polytechnic, Regent Street, in connection with the Congress. Central floor-space for stalls is to be let in blocks of 8ft. by 6ft., price £10 10s. each (including one page of description in official programme and catalogue); extra frontage £1 1s. per foot; wall-space in blocks 10ft. by 8ft. at £7 per block (also with one page of description in programme and catalogue). Full particulars can be obtained from the ecretary of the exhibition, Royal Institute of Public Health, Russell Square, W.C.

Dublin Master Builders' Association.—Mr. James Beckett has been elected president for 1905 and Mr. Thomas Conolly vice-president.

Dissolutions of Partnership. — Messrs. Mallett & Wood, builders and contractors, of Luton, have dissolved partnership; also Messrs. Knight Brothers, builders and contractors, of Bethnal Green.

New Lunatic Asylum for Essex.—The Essex County Lunatic Asylum at Brentwood being inadequate, the county council has decided to erect a new building at Colchester at a cost of half a million sterling.

The Stobhill General Hospital, Glasgow, is being warmed and ventilated by means of eighty Shorland's double-fronted patent Manchester stoves with descending smoke flues, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

Institution of Heating and Ventilating Engineers.—The annual general meeting of this Institution was held on January 17th at the Holborn Restaurant, Mr. J. Palmer in the chair. Mr. George Crispin delivered his presidential address, in the course of which he suggested that during the year a competition for boilers up to 2,000ft. heating power might be held in the neighbourhood of a town such as Stourbridge, somewhat similar to the one held at Liverpool about fifteen years ago. A paper on "The Science of Ventilation: The Advantages and Limits of 'Natural' and 'Mechanical' Systems Compared" was read by Mr. J. D. Sutcliffe. Prize medals were presented to Mr. J. Nelson Russell and Mr. A. H. Barker for the two best papers read during the past year. The annual dinner was held in the evening. The next meeting of the Institution will be held at Bristol on June 20th and 21st.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending January 18th twenty-nine failures in the building and timber trades in England and Wales were gazetted.

E. STONHAM, builder, Ilford. R.O. Jan. 12th.

J. ALMOND, builder, St. Helens. R.O. Jan. 14th.

A. GEARY, builder, Burton-on-Trent. Adj. Jan. 12th.

E. SPICER, builder, Mortlake. R.O. Jan. 12th.

STEVENS & Co., builders, Southall. R.O. Jan. 10th.

C. MOELLER & Co., engineers, Bradford. Adj. Jan. 11.

F. JOHNSON, timber merchant, Urmston. R.O. Jan. 12th.

W. P. MULHOLLAND, builder, Great Crosby. P.E., Liverpool C.C., Feb. 2nd, at 11.

W. GOODMAN, plumber, Leicester. P.E., The Castle, Leicester, Feb. 3rd, at 10.

NEWTON & BURGESS, builders, Clapham Junction. R.O. Jan. 10th.

D. J. DAVIES, builder and contractor, Blaengarw. P.E., Cardiff Town Hall, Feb. 6th, at 11.

W. J. RICE, builder, Lowestoft. Gross liabilities £10,140; estimated surplus £832.

J. E. BUCKELDEE, builder and contractor, Hillingdon. Liabilities £914; assets estimated to produce £110.

J. DAY, builder, Wolverhampton. Gross liabilities £1,724; estimated surplus £186.

CHARLES BROTHERS, builders and contractors, Moseley. Liabilities £1,605; assets £926.

F. KEMP, builder, Hove. First meeting, O.R.'s, Brighton, Jan. 25th, at 11.30. P.E., Brighton C.C., Feb. 2nd, at 11.

E. W. SANDERS, builder, Rottingdean. First meeting, O.R.'s, Brighton, Jan. 25th, at 12. P.E., Brighton C.C., Feb. 2nd, at 11.

W. H. WESS, builder, Acock's Green. First meeting, 191, Corporation Street, Birmingham, Feb. 1st, at 11. P.E., Birmingham C.C., Feb. 23rd, at 2.

T. PHILLIPS, contractor, Barnsley. First meeting, O.R.'s, Barnsley, Jan. 25th, at 10.30. P.E., Barnsley C.C., same day, at 11.30.

D. ROBERTS, late builder, Chorlton-cum-Hardy. Gross liabilities of £4,183 expected to rank at £1,015; deficiency £127; assets £887.

J. SMITH & Co., moulding and joinery manufacturers and importers, Lambeth, Walworth, Barking and Liverpool (adjudged bankrupts Oct. 1904). Joint liabilities £33,629; assets £14,000. Discharge of Jonas Smith granted subject to his consenting to judgment for £100. T. W. Smith's discharge suspended for two years.

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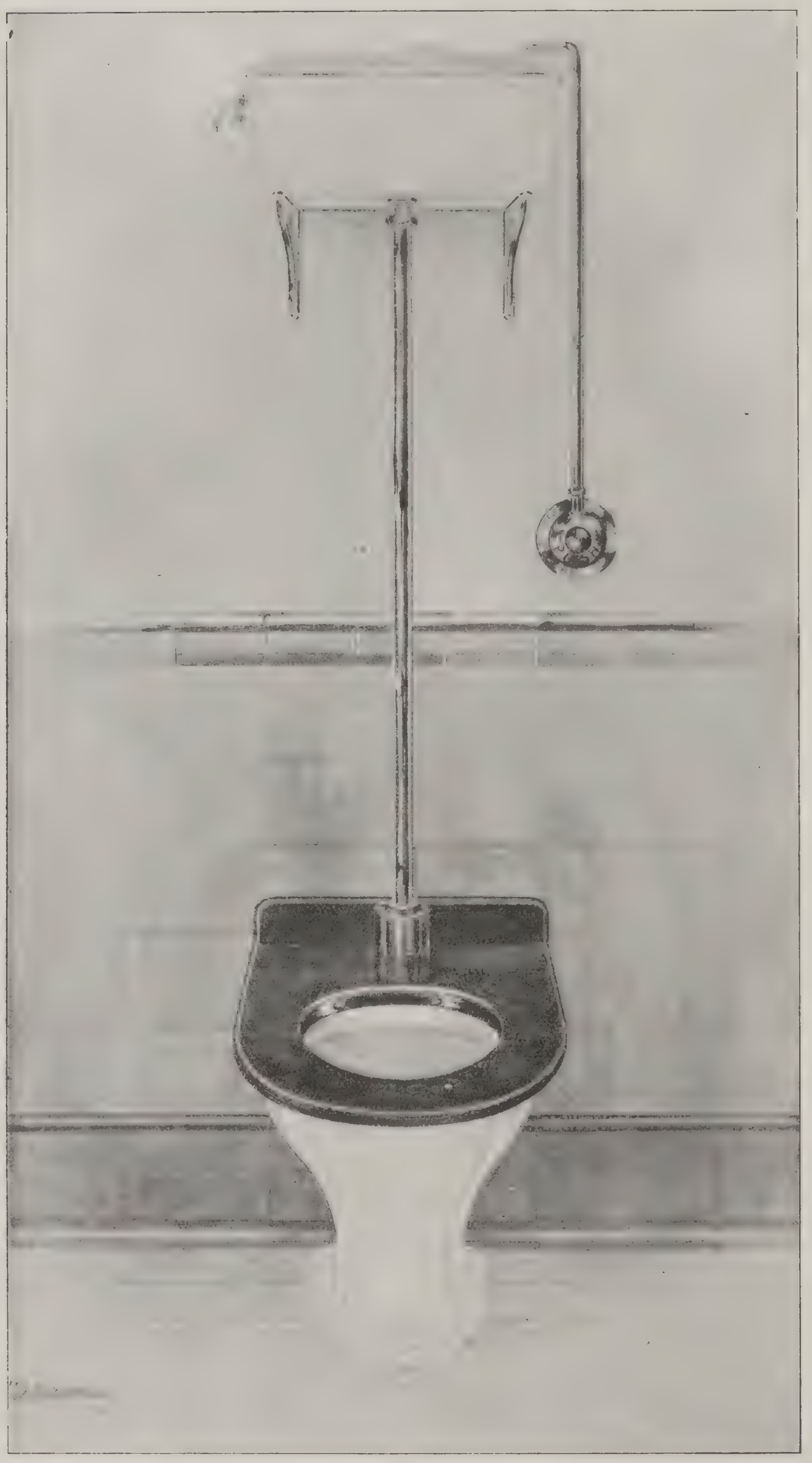

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Obituary.

Mr. Isaac Rutter, builder, of Willington, died recently, aged 83.

Mr. W. Goldsworth, surveyor, of Prescot, died recently, aged 81.

Mr. T. W. Shore, of Balham, a well-known antiquary, died recently.

The late Mr. John Parnell, builder and contractor, of Rainsbrook, Rugby, left estate of the gross value of £107,381.

Mr. W. Webb, for many years a builder in Dudley in partnership with Mr. Mark Round, died recently.

Mr. J. Farquharson, of the firm of S. & R. Slater, builders, Edinburgh, died last week in his fifty-seventh year.

Mr. G. H. Stanger, F.R.I.B.A., A.M.I.C.E., of the firm of Stanger & Stanger, civil engineers, architects and surveyors, Wolverhampton and Westminster, died recently, aged 57. He was architect of the cottage homes at Wednesfield, the extensions of Burntwood Asylum, the large works at Bushbury for the Electric Construction Co., the Wolverhampton Steam Laundry, extensions of the out-patient department at the Wolverhampton and Staffordshire General Hospital, and Moseley Village Board school. The last important work on which he was engaged was an isolation hospital at Harrogate.

Mr. Thomas Blashill, F.R.I.B.A., formerly architect to the London County Council, died on Friday at 29, Tavistock Square, after a short illness, in his seventy-fifth year. He was elected an Associate of the Royal Institute of British Architects in 1866 and a Fellow in 1877. Mr. Blashill had been a member of the council, and was also a member of the council's Board of Examiners for Architecture and of the Statutory Board of Examiners. He was also a Fellow of the Surveyors' Institution and of the Zoological Society, and a member of the British Archæological Association and of the London Architectural Association, of which society he was president in 1862. Formerly he held a commission in the Honourable Artillery Company. He was the son of Mr. Henry Blashill, of Sutton-on-Hull, Yorkshire, and was born in 1830. He was educated at Hull and Scarborough, and professionally at University College and in London offices. Mr. Blashill formerly practised on his own account as an architect, and afterwards occupied the position of district surveyor in London. He was one of the founders of the British Fire Prevention Committee. He was a familiar figure at the Institute meetings, and his opinion on constructional matters was much valued. It was during his occupancy of the position of architect to the London County Council that the large rebuilding of the Boundary Street area, Bethnal Green, was carried out.

St. Erkenwald's Church, Southend, is now being erected from designs by Mr. Walter J. Tapper. It will consist of a nave of four bays, with a north aisle, at the eastern end of which will be a morning chapel and a chancel of two bays. There will be accommodation for 810 worshippers, and the total cost will be about £15,000.

L.C.C.

THE adjourned report of the Works Committee for the half year ended September 30th last came up before yesterday's meeting of the London County Council. This showed a balance of cost below final certificate of £10,674, or 10·88 per cent. on the total of the final certificates. Ten out of eleven works were carried out at a cost below final certificate. The total of the accepted estimates for the works completed during the half year amounted to £104,208, while the total of the final certificates was £98,062. As in previous statements, the total of the accepted estimates considerably exceeded the total of the final certificates. In this case the excess amounted to £6,145, or 6·26 per cent. Among the costs was that of £3,058 for again remetalling the Victoria Embankment. The Bridges and Improvements Committee recommended the Council not to give further consideration for the present to the proposal to transfer Charing Cross Station to the other side of the river and rebuild Hungerford Bridge, and the Bridges Committee further reported in respect of the new Vauxhall Bridge that although more than one-half of the contract time had elapsed the total value of the work executed on the bridge site was only £25,600, or barely 22 per cent. of the contract sum, excluding provision money of £117,082. The greater part of the more difficult work still remained to be done.

A Large College is to be built on the Fairhaven Estate near Lytham.

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Jan. 26	London, E.—School	London County Council	Architect's (Education) Department, Room 148, Education Offices, Victoria Embankment, E.C.
" 26	Gillingham, Kent—Hall	—	F. Smith, Carrara Buildings, High Street, Gillingham.
" 26	London, E.—Alterations at Workhouse	Guardians	J. & W. Clarkson, 136 High Street, Poplar.
" 26	Rainhill—Mess-room to Asylum	Committee of Visitors	J. Gornall, Clerk's Office, Rainhill Asylum, Lancs.
" 26	Stepney—Alterations at Workhouse	Guardians	J. & W. Clarkson, 136 High Street, Poplar, E.
" 27	Pontnewydd, Wales—Two Houses	—	Stone House, Richmond Road, Pontnewydd.
" 27	Southend—Erecting Building	Corporation	E. J. Elford, Borough Engineer, Southend.
" 28	Teignmouth—Wall, &c.	Urban District Council	C. F. Gettings, Town Hall, Teignmouth.
" 28	Bradford—Warehouse	—	Jackson & Son, Tanfield Chambers, Bradford.
" 28	Cardiff—Exits	Guardians	E. Seward, Queen's Chambers, Cardiff.
" 28	Holyhead—Gardener's Cottage	—	R. R. Williams, Stanley House, Holyhead.
" 28	Grange, Rhos, Wales—School	Education Authority	W. Slater, 9 High Street, Wrexham.
" 28	Ruthin—School	Education Authority	W. Slater, 9 High Street, Wrexham.
" 28	Wolverton—School	Education Committee	C. W. Watkins, Education Offices, Aylesbury.
" 30	Blything—Fire-escape Staircase	Guardians	H. A. Mullens, Union Offices, Bulcamp, Halesworth, Suffolk.
" 30	Belfast—Buildings	Tramways and Electricity Committee.	Surveyor's Office, Town Hall, Belfast.
" 30	Selly Oak—Two Libraries	Urban District Council	A. W. Cross, 23 Valentine Road, King's Heath, Birmingham.
" 31	Rhydfelen, near Pontypridd—Twenty-five Cottages	Urban District Council	P. R. A. Willoughby, Surveyor's Office, Rhydfelen.
" 31	North Shields—Wall	—	J. F. Smillie, Borough Surveyor, Tynemouth.
" 31	Blaenanerch, near Cardigan—Villa	Mr. D. Williams	David Williams, Rhyd, Blaenanerch.
" 31	Tavistock—Building	Lighting, Coal and Coke Co.	A. Francis, Gas Works, Tavistock.
Feb. 4	Aberystwyth—Tower, &c., to Church	—	Nicholson & Hartree, Architects, Hereford.
" 4	Carlisle—Alterations, &c., to Property	Corporation	H. C. Marks, 36 Fisher Street, Carlisle.
" 7	Pontypool—Rebuilding of Inn	—	D. J. Lougher, Bank Chambers, Pontypool.
" 7	Farnham—Grammar School	Governors	Jarvis & Richards, 36 Victoria Street, S.W.
" 7	Carmarthen—Engine-shed	Directors of G.W. Railway	Engineer's Office, Neath Station.
" 7	Leeds—Sorting Office	Commissioners	Secretary, H.M. Office of Works, Storey's Gate, S.W.
" 8	Wembley—Four Cottages	Urban District Council	C. R. W. Chapman, Public Offices, Wembley.
" 9	Twickenham—Cottages, &c.	Council	F. W. Pearce, Town Hall, Twickenham.
" 9	Goring-on-Thames—Gasworks Extensions	Thames Valley and Water and Gas Co.	Thames Valley and Goring Water and Gas Co., 20 Bucklersbury, E.C.
" 9	Kirton, Lincs—Laboratory	—	J. Rowell, Church Lane, Boston.
" 10	Southend—Extensions of Boiler-house	Corporation	E. J. Elford, Borough Engineer, Southend.
" 11	Woking—Retort-house	District Gas Co.	W. A. Valon & Son, 140 Temple Chambers, E.C.
" 11	Shepton Mallett—School	Education Committee	County Education Secretary, Weston-super-Mare.
" 28	Preston—School	Corporation	Director of Education, Education Offices, Preston.
March 4	Nelson—Free Library	Corporation	J. H. Baldwick, Town Hall, Nelson.
No date	Llanbedr—School	Merioneth Education Committee	A. M. H. Jones, Plas Ynys, Porth, R.S.O.
	ENGINEERING:		
Jan. 26	Swindon—Boiler	Corporation	J. G. Griffin, Electricity Works, Swindon.
" 26	Manchester—Iron and Steel Work	Gas Committee	C. Nicholson, Gas Department, Town Hall, Manchester.
" 28	Giurgevo, Roumania—Electric Light	—	Municipal Offices, Giurgevo.
" 28	Drax, near Selby—Electric Lighting	—	W. St. D. Brennan, Read's Grammar School, Drax.
" 30	Ardeer, N.B.—Water Pipe	Nobel's Explosives Co., Ltd.	Work's Manager, Ardeer Factory.
" 30	Swansea—Brick and Flag Plant	Corporation	Borough Surveyor, 13 Somerset Place, Swansea.
" 30	Edinburgh—Gas Exhausters, Engines, &c.	Gas Commissioners	W. R. Herring, New Street Gasworks, Edinburgh.
" 30	Chertsey—Construction of Two Bridges	Rural District Council	R. St. George More, 17 Victoria Street, S.W.
" 30	North Shields—Gasholder Tank	Tynemouth Gas Co.	Engineer's Office, Gas Works, North Shields.
" 31	Thames Ditton—Bridge	Urban District Council	A. J. Henderson, Council Offices, Portsmouth Road, Thames Ditton.
" 31	Halifax—Coal Conveyor, &c.	Tramways & Elec. Committee	W. M. Rogerson, Foundry Street, Halifax.
" 31	Ebbw Vale, Wales—Reservoir, &c.	Urban District Council	T. Hughes, Clerk, Ebbw Vale.
Feb. 1	Manuden, Essex—Bridge	Stansted Rural District Council.	C. Hicks, Stansted, Essex.
" 1	Grimsby—Water-purifying Plans, &c.	Electricity Department	W. A. Vignoles, Borough Electrical Engineer, Grimsby.
" 2	Handsworth, Birmingham—Power and Lighting Circuits	Urban District Council	H. Ward, Council House, Handsworth.
" 2	Salford—Re-construction of Bridges	Building and Bridges Committee	C. S. Allott & Son, 46 Brown Street, Manchester.
" 4	Kirkcaldy—Extension of Pier	Town Council	W. M. Macindoe, Town Clerk, Kirkcaldy.
" 6	Ebbw Vale, Wales—Reservoir, &c.	Urban District Council	T, Hughes, Clerk, Ebbw Vale.
" 8	Arbroath, N.B.—Supplying and Laying Water Pipes	Corporation	Crouch & Hogg, 53 Bothwell Steel, Glasgow.
" 11	Woking—Gasholder, &c.	District Gas Co.	W. A. Valon & Son, 14c Temple Chambers, E.C.

Complete List of Contracts Open.—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		ENGINEERING—*cont*		
Feb.	13	Nottingham—Reservoir	Water Committee...	F. W. Davies, Water Office, Peter's Square, Nottingham.
,,	17	Cape Clear, co. Cork—Breakwater, &c.	——	Assistant Surveyor of Buildings, 1 River View, Summer Hill, Cork.
March	31	Shanghai—Electric Tramways	Municipal Council...	J. Poor & Co., 63 Leadenhall Street, E.C.
April	1	Lulea, Sweden—Dredging...	——	Harbour Office, Lulea, Sweden.
,,	10	St. George's Harbour, Bermuda—Deepening, &c., Channel	Government	Coode & Son & Matthews, 9 Victoria Street, S.W.
May	1	Suakin (Red Sea)—Lighthouse	Ports and Lights Administration	Deputy-Controller-General, Ports and Lights Administration, Alexandria, Egypt.
		IRON AND STEEL:		
Jan.	26	Johannesburg, S.A.—Rails	Municipal Tramways	Mawdey & Dawbarn, 82 Victoria Street, S.W.
,,	26	London, S.E.—Ironmongery, &c.	Lambeth Borough Council ...	H. Edwards, 346 Kensington Road, S.E.
,,	28	Harrogate—Steel Pipes	Corporation...	E. W. Dixon, 14 Albert Street, Harrogate.
,,	28	Bradford—Rails	Corporation	Town Clerk's Office, Town Hall, Bradford.
,,	30	Bulcamp, Suffolk—Fire-escape Staircase	Guardians	H. A. Mullens, Clerk, Bulcamp.
Feb.	3	Sheffield—Pipes	United Gaslight Co.	H. Thomas, General Manager, Commercial Street, Sheffield.
March	7	Brisbane, Australia—Rails, &c.	——	Agent-General for Queensland, 1 Victoria Street, S.W.
		PAINTING AND PLUMBING:		
Jan.	26	London, S.E.—Oils and Colours	Lambeth Borough Council ...	H. Edwards, 346 Kennington Road, S.E.
,,	26	Southampton—Painting Exterior of Building...	Guardians	Mitchell & Son & Gutteridge, 9 Portland Street, Southampton.
Feb.	1	Rochester—Painting Interior of Building	Corporation...	W. Banks, Guildhall, Rochester.
,,	6	Manchester, Liverpool, &c.—Painting	Lancs and Yorks Railway Co. ...	Engineer's Office, Hunt's Bank, Manchester.
		ROADS AND CARTAGE:		
Jan.	26	London—Road-work and Plate-laying	London County Council... ..	Council's Chief Engineer, County Hall, Spring Gardens, S.W.
,,	26	Pontypridd—Tar-paving Playgrounds	Education Committee	P. R. A. Willoughby, Pontypridd.
,,	26	Andover—Channelling	Rural District Council	J. Wormald, District Surveyor, Andover.
,,	26	Harrogate—Street Works	Corporation...	F. Bagshaw, Borough Engineer, Harrogate.
,,	26	London, S.E.—Broken Granite, &c.	Lambeth Borough Council ...	H. Edwards, 346 Kennington Road, S.E.
,,	27	Spilsby, Lincs—Broken Granite	Rural District Council	T. A. Bushridge, District Surveyor, Spilsby.
,,	28	Hatfield, Herts—Granite and Slag	County Council	Urban A. Smith, County Surveyor, Hatfield.
,,	28	Sleaford, Lincs—Granite, &c.	Rural District Council	E. Clements, 74 Southgate, Sleaford.
,,	28	Bicester, Oxon—Road Repairs, &c.	Rural District Council	J. W. Tubb, Fewcott, Bicester.
,,	28	Llandaff—Limestone, &c.	Rural District Council	J. Holden, 20 Park Place, Cardiff
,,	28	Worcester—Road Stone, &c.	Highways & Bridges Committee	J. H. Garrett, Shire Hall, Worcester.
,,	30	Stockport—Granite Setts	Corporation...	J. Atkinson, Borough Surveyor, Stockport.
,,	30	Colchester—Making-up Roads	——	E. S. Beard, Head Gate, Colchester.
,,	30	Cleethorpe—Kerbing, &c.	Urban District Council	Council's Surveyor, Poplar Road, Cleethorpes.
,,	31	Sanghall Massie, Cheshire—Road	Wirral R.D.C.	T. Davies, 33 Kingsland Road, Birkenhead.
,,	31	Hoole, Cheshire—Street Works	Urban District Council	H. Davis, 14 Newgate Street, Chester.
Feb.	1	Kettering—Granite, &c.	Rural District Council	H. Norwood, 11 Bowling Green Avenue, Kettering.
,,	1	Sale, Cheshire—Kerbs, Setts, &c.	Urban District Council	W. Holt, Council Offices, Sale.
,,	2	Isle of Ely—Broken Materials	County Council	H. Farr Simpson, County Surveyor, Northern Division, Wisbech. R. S. W. Perkins, County Surveyor, Southern Division, Ely.
,,	3	Brandon, Durham—Slag, &c.	Urban District Council	G. G. Donkin, Surveyor, Langley Moor.
,,	6	Cheriton, Kent—Paving, &c.	Urban District Council	Surveyor's Office, Public Offices, Cheriton.
,,	9	West Ham—Paving Materials, &c.	Council	Borough Electrical Engineer's Office, Town Hall, Stratford, E.
,,	20	Hornsey—Road Materials, &c.	Town Council	E. J. Lovegrove, 99 Southwark Lane, Highgate.
		SANITARY:		
Jan.	26	Stroud—Sewering, &c.	Rural District Council	Fisher & Milnes, 6 Rowcroft, Stroud.
,,	26	Llandaff—Sewerage Works	Rural District Council	B. Latham, Parliament Mansions, Victoria Street, S.W.
,,	26	Wigston Magna, Leics—Sewer, &c.	Urban District Council	W. G. J. Clark, Council Offices, Station Road, Wigston Magna.
,,	27	Lytham—Sanitary Conveniences on Beach	Urban District Council	A. J. Price, Council Offices, Lytham.
,,	28	Sowerby Bridge, Yorks—Sewage-disposal Works	Urban District Council	C. L. Whitehead, Holling's Mill Lane, Sowerby Bridge.
,,	30	Windsor—Sewer	Streets Committee	Borough Surveyor's Office, Windsor.
Feb.	1	Kettering—Disinfectants	Rural District Council	H. Norwood, 11 Bowling Green Avenue, Kettering.
,,	1	Rawtenstall—Convenience	Corporation...	J. Johnson, Borough Surveyor, Rawtenstall.
,,	6	Beckenham—Drainage of Roads...	Urban District Council	J. A. Angell, Surveyor, U.D.C., Beckenham.
,,	6	Cheriton, Kent—Removal of Refuse	Urban District Council	Public Offices, Cheriton.
,,	7	London, N.—Sewer	London County Council... ..	Maurice Fitzmaurice, County Hall, Spring Gardens, S.W.

List of Competitions Open.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Jan.	30	Swansea—Brick and Flag Plant	——	£1 1s.	Borough Surveyor, 13 Somerset Place, Swansea.
,,	31	Llanelly—Remodelling School Buildings	£20 & £10	——	J. W. Watkins, Education Office, Llanelly.
Feb.	1	Oxford—School	——	£1 1s.	Education Committee, 8 New Road, Oxford.
,,	28	Aylesbury—School	£50 & £25	£1 1s.	C. G. Watkins, Education Office, Aylesbury.
,,	28	Wolverton—School	——	£1 1s.	C. G. Watkins, Education Office, Aylesbury.
Mar.	30	London, S.W.—Municipal Buildings...	——	£1 1s.	H. J. Smith, Town Hall, Kennington Green, S.E.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

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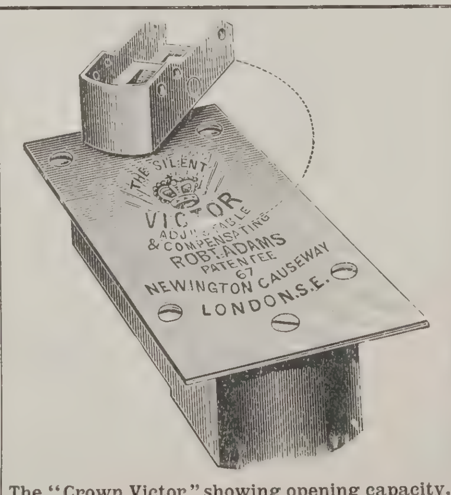

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THE

BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

February 1, 1905. Vol. 21, No. 521. 6, Great New Street, Fetter Lane, E.C.

Summary.

The Nottingham Architectural Society has passed a resolution supporting architects' registration and hoping that the Institute will prosecute the early adoption of the Bill. The president, Mr. Brewill, said that, as far as possible, all points of difference were being eliminated from the Bill, and if in that way the thin edge of the wedge could be got in, all the other matters they would like to see brought about might follow in due course. (Page 57.)

The £2,000 for the employment of 200 men at the First Garden City has been more than subscribed. (Page 64.)

British standard tables of pipe flanges have been issued by the Engineering Standards Committee. (Page 64.)

It was Mr. W. E. Riley, superintending architect to the London County Council, who prepared the sketch design for the Victoria Station wall along Buckingham Palace Road. (Page 67.)

The Works Committee of the Leeds Corporation has decided in favour of the Colsterdale reservoir being carried out by contract. (Page 64.)

A bricklayer at Birmingham who was injured whilst helping a foreman to move a girder has been refused compensation, Judge Whitehorne holding that the accident did not arise out of the bricklayer's employment. (Page 59.)

Mr. Howard Pentland, B.A., F.R.I.B.A., in a paper on old plasterwork in Dublin which he read before the recent convention of the Master-Painters' Association of Ireland, said he knew of only one example of such work n which Wren was concerned, and that was the ceiling of the chapel at the Royal Hospital, Kilmainham. (Page 58.)

In a paper on Byzantine architecture which he read before the Architectural Association on Friday Mr. J. B. Fulton said that no other building could compare with Santa Sophia in beauty, fine proportion and delicate detail. Mr. E. F. Reynolds, in a paper on the same subject, said the uniqueness and originality of the building lay in the combination of two types of plan which hitherto had been developed more or less separately—the basilican and the radial, the former being ounded on a repetition of bays in length and he latter on a repetition of bays around a common centre. (Page 61.)

Mr. Reginald Blomfield has been elected an A.R.A. (Page 64.)

English building stone is being extensively used in South Africa. Even though carried 7,000 miles over sea, it is said to be cheaper han local stone, which is difficult to work, and for which means of transport are deficient. (Page 60.)

The brick trade in Northamptonshire is very depressed. (Page 64.)

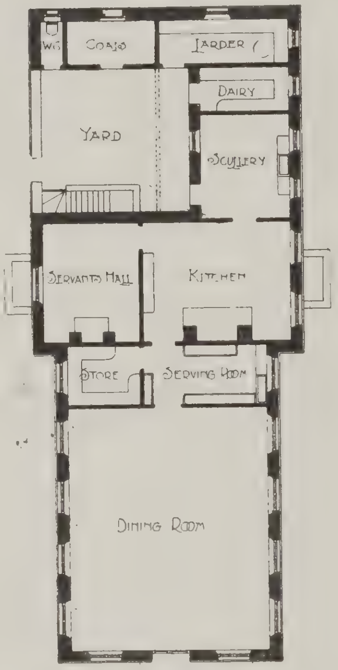
Registration: An Interim Announcement. THOUGH some speakers have suggested that the Institute committee on architects' registration is not alive and at work, the fact is quite the reverse. The full and careful consideration of this most difficult matter must necessarily involve much time. The question is not to be settled off-hand. And it must not be decided hurriedly. Architects, therefore, should bear themselves in patience till the committee's report is to hand. We note continual references in the provinces, the latest from Nottingham (as reported in this issue), and these convince us of the great bulk of opinion in favour of registration that exists throughout the Kingdom. It is not our purpose now to re-open the discussion on the subject, but we think it interesting to give the following particulars concerning the position of architects in Europe and America which have been collected for the purposes of the committee. The profession is absolutely free in Austria, Holland, Belgium, Switzerland, Norway and Sweden, France, Turkey, Portugal and the United States (excepting three States). It is free (but Government officials require diploma) in Germany, Hungary and Greece. A diploma is required in Italy, Spain, Russia and Illinois (U.S.A.). In Germany architects who have studied in the State high schools can enter for the examination granting the title of "Government architect," which title is obligatory for architects of public works and is now almost always required for city architects. In Austria there are Government diplomas, but they are little sought after by artists, as they only have a scientific value. In Hungary, though the profession is free, an architect holding an official position must be provided with a diploma granted by the Polytechnic School of Budapesth after a four years' course. Holders of this diploma alone are recognized by the Courts as official experts or "Directors of Buildings." In Holland the State Polytechnic School of Delft grants a diploma of architect-engineer after a four years' course; but this is in no way obligatory. In Italy the compulsory diploma is granted by the Government on the recommendation of the Examination Commission of the Government "Schools of Application." The scientific side is dominant. The same diploma is given to both architect and engineer. In Spain the architect must pass examinations after his studies and be provided with the diploma granted by the only two schools that exist in Spain: the Superior School of Architecture, Madrid, and the School of Architecture, Barcelona. In Russia the compulsory diploma or certificate is granted by the Imperial Academy of Fine Arts, the Moscow School of Architecture, and the State Polytechnic Schools. A certificate is granted to *bona-fide* practitioners and assistants after passing an examination held by the Technical Committee of the Minister of the Interior; this, however, does not give the title of architect but the right only to practise. In Greece the Government gives no diploma, but the diploma granted by the School of Art of Athens is sought for only by those who wish to occupy an official position. In France the Government gives diplomas to the nominees of the Ecole des Beaux-Arts and the title "Architecte diplômé par le Gouvernement"; but these diplomas confer no privileges or rights whatever, and no official need possess the diploma or any other certificate of an examining body.

Buttresses. A CORRESPONDENT, referring to an illustration of a small house in our last issue, raises a point of some interest which has on numerous occasions been the subject of criticism. He says: "I notice the west side is well shored up with two buttresses at the angles of the ingle-nook. It would be interesting to know whether the house is liable to be blown over by easterly gales or whether the ground on the west side is treacherous." It is surprising to find eminent architects adopting buttresses where there can be no possible constructive reason for them. Of course we all know what their answer would be, namely, that they feel them necessary in order to give the right note in the proportion of the elevation; that these buttresses look well, are picturesque, or are in "style." All this supposes that there are no rules and no reasons in architectural design except personal taste. This last Heaven-sent commodity has been the bane of modern architecture. The architect who takes this view is merely using the same old shibboleth as the painter, the sculptor, the poet, the musician, the actor and others who imagine they can become artists without training and study. Graphic design (into whose sphere it might be argued these useless buttresses would come) is just as much subject to the principle that the form must be dictated by its function as is engineering design. These buttresses are illogical if they serve no constructive purpose, and they are therefore bad art. In churches of Gothic design they are often found in obedience to some rule of a Church society. There is one modern Nonconformist church in North London where a small stone entrance porch has huge buttresses of about 3ft. projection at the base; and many modern houses look almost as ludicrous. The buttress that is not designed to take a thrust belongs to the school of "L'Art Nouveau," and together with the blocked column and the split pediment betrays an ignorance of what architecture is.

WINSLEY SANATORIUM.

THE Winsley Sanatorium has been built by the executive committee of the Gloucestershire, Somersetshire and Wiltshire branch of the National Association for the Prevention of Consumption, and is intended for the use of the consumptive poor of the three counties. Forty of the beds are maintained by town and rural district councils, individual firms, groups of persons and private donors; the remaining twenty beds being maintained by an average payment of 6s. per week per patient. Dr. Lionel Weatherley, the chairman of the executive committee, has throughout given the closest personal attention to every detail, and the successful realization of the scheme may be truly said to be entirely due to his untiring energy and devotion. Accommodation for sixty patients is provided in two buildings, one constituting the administrative block and the other containing bedrooms only, each consisting of a long narrow block one room deep, with a corridor immediately behind. The administrative block is of two storeys only, except at each end, where six bedrooms and linen-rooms are provided on the second floor. The ground floor of this block contains a spacious reception room with a large bay window, four rooms for the use of the resident doctor, two rooms for the matron and six bedrooms for patients. A large cloakroom is placed at each end of the building and immediately opposite are two projecting wings containing the staircases, bathrooms, lavatories, w.c.'s and housemaids' closets: all being separated from the corridors by cross-ventilated passages. The first floor is arranged in an exactly similar manner and contains, in addition to the above-mentioned sanitary provisions, sixteen bedrooms, fourteen of which are for patients and the remaining two for nurses. The bedroom block consists of three floors: the ground floor contains two cloak-rooms and ten bedrooms, while the first and second floors each have twelve bedrooms, in addition to a linen-room and two bedrooms for nurses. In the wings at each end are the staircases, bathrooms, w.c.'s and housemaids' closets. The corridors are wide and have bay windows at intervals, and are amply lighted and ventilated. At each end are the exit doors, with ventilating fanlights over, a through current of air from end to end being thus secured. The rooms in the administrative block are 13ft. 6ins. by 11ft. 6ins. and 10ft. by 9ft. 6ins. upon the ground and first floors respectively. In the bedroom block the rooms are 12ft. 6ins. by 11ft. and 9ft. 6ins. high, and each room is lighted by very wide and lofty windows extending up to the ceiling. The windows throughout are wooden casements and frames with mullions and transoms, every light opening; the parts below the transoms are hinged at the sides and open outwards, while those above are hinged at the top and open in a similar manner. In the walls opposite the windows, and above the level of the door-heads, the whole width of each room is filled in with casements and frames extending to the ceiling, every one opening upon centres, thus securing complete cross-ventilation. Some of the bedrooms are provided with fireplaces for use in certain cases, but the building is heated throughout by hot water upon the low-pressure system.

The block containing the dining hall and kitchen and offices connected therewith is entirely detached from the main block, being approached by a paved walk, merely roofed over. The dining hall is a lofty apartment 33ft. by 27ft., and capable of accommodating sixty patients, with additional seats for the doctor and two or three visitors. The room is lighted by eight lofty windows, four on each side, and two at the end where the main entrance is placed. At the opposite end is the serving-room, provided with a hot-plate, butler's sink and cupboards for china, glass and plate. Opposite to the serving-room is a large storeroom. A servants' hall adjoins the kitchen.



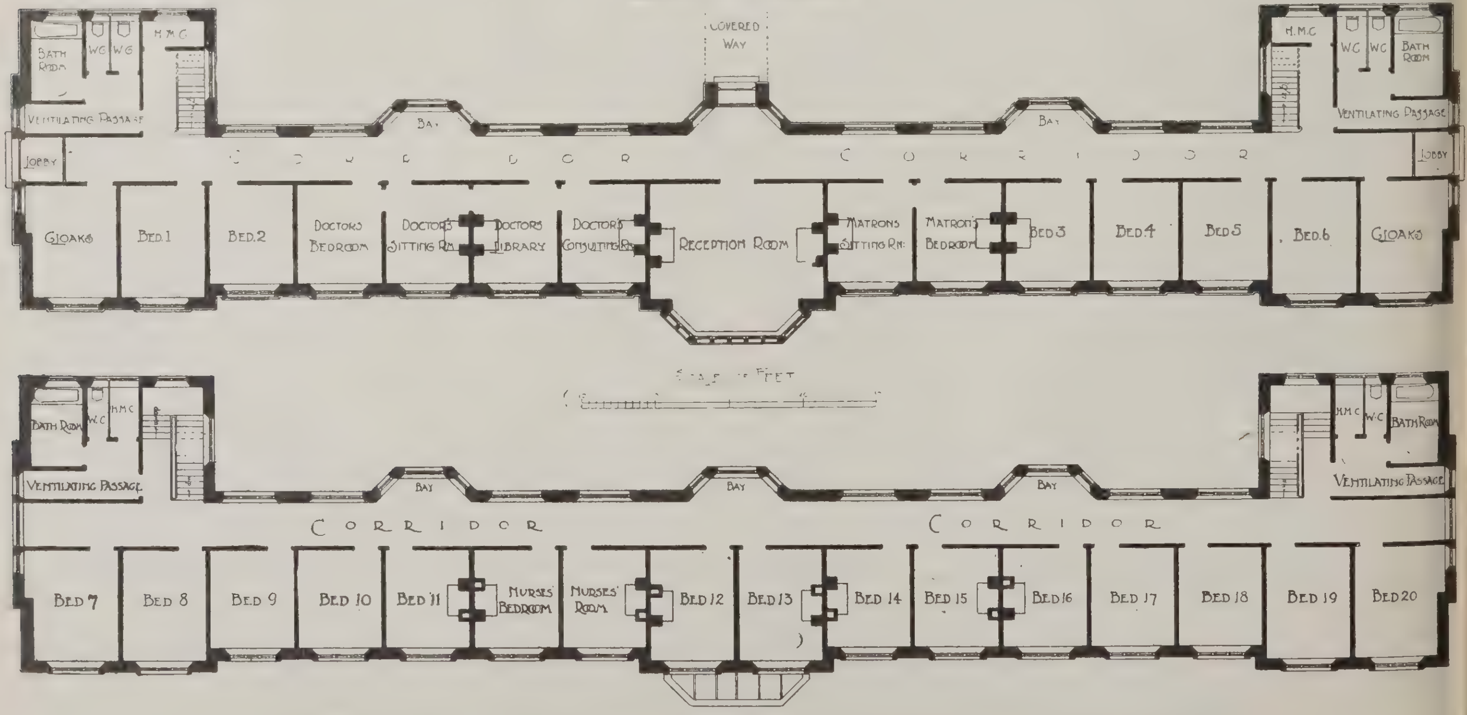
The serving-room communicates with the kitchen, and beyond is the scullery. The dairy and larder are placed outside and are approached by a covered way, being thus cut off by the open air from the kitchen and scullery. A small enclosed yard is provided, in which are placed the coal store and the servants' w.c., and also the approach to the heating chamber and coke store, which are under the kitchen and servants' hall.

All the interior walls are finished with hard plaster, and circular angles are everywhere adopted; right angles and mouldings being avoided wherever possible. Every precaution has been taken to secure perfect cleanliness in the sanitary fittings, and the drains are of Doulton's salt-glazed stoneware socketed pipes, jointed in cement. The sewage from the buildings is carried to an old quarry situated in the grounds, and is there effectively treated on the most modern biological system. Rainwater is collected in a large tank constructed in another quarry and utilized for laundry purposes. Drinking water is obtained from a local company, a large iron tank providing sufficient storage.

The buildings and grounds are lighted by electric light, a very complete plant having been laid down for the purpose. The laundry is quite away from the main buildings, and adjoins the electric-light station.

Accommodation for servants has been provided by adapting some existing cottages; thirteen bedrooms, a bathroom and storeroom being thus obtained.

The furniture is of the simplest character, and has been designed by the architects for sanatorium purposes. Each bedroom contains a white enamelled bedstead, washstand, dressing chest, wardrobe, bedside table, a comfortable arm-chair and a single chair: the whole (with the exception of the arm-chair) being enamelled white and having nickel-plated fittings. The floors are covered with specially-made floorcloth. A rest shelter 100ft. long forms a connection between the



WINSLEY SANATORIUM: GROUND- AND FIRST-FLOOR PLANS. SILCOCK AND REAY, ARCHITECTS.

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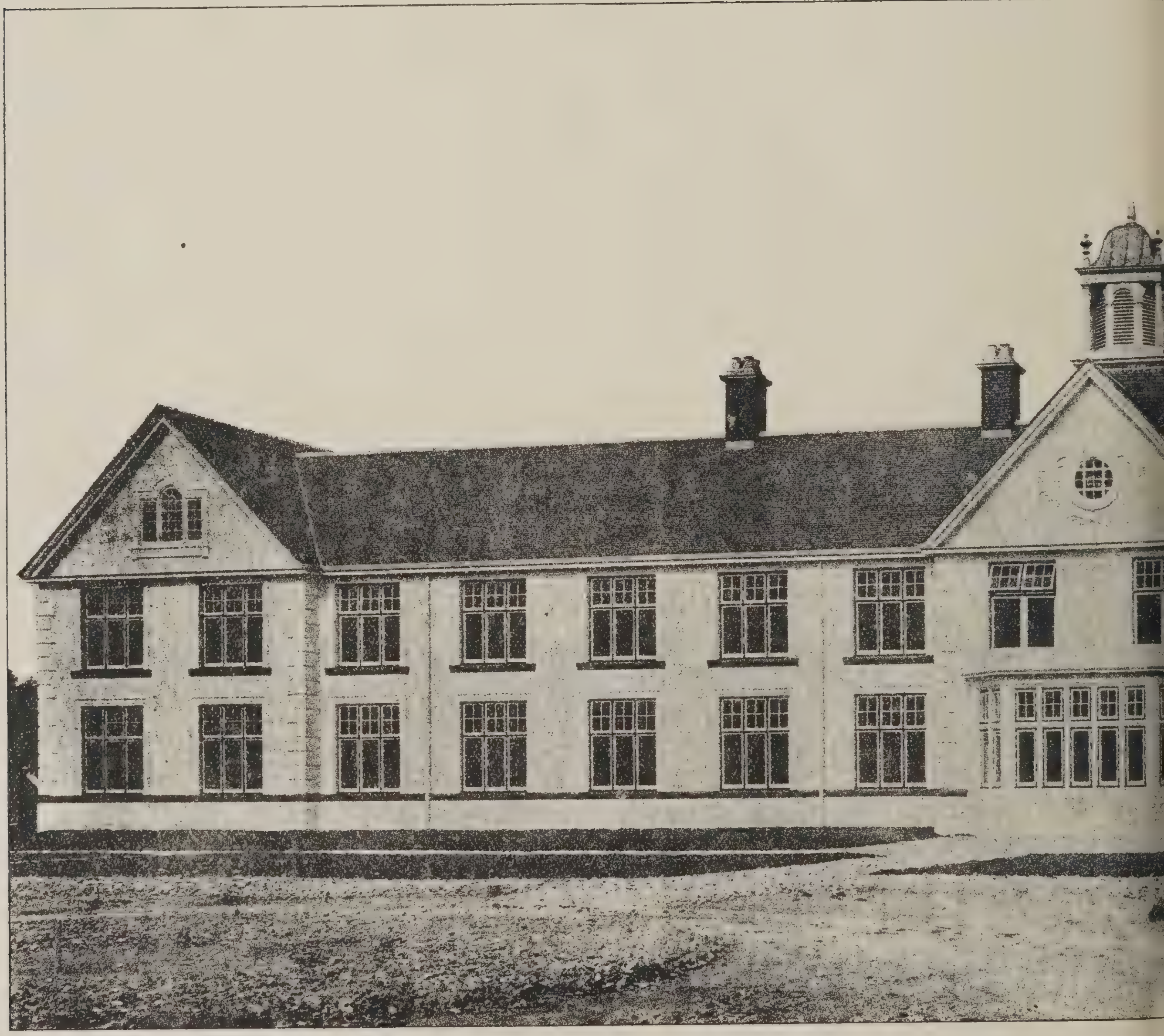
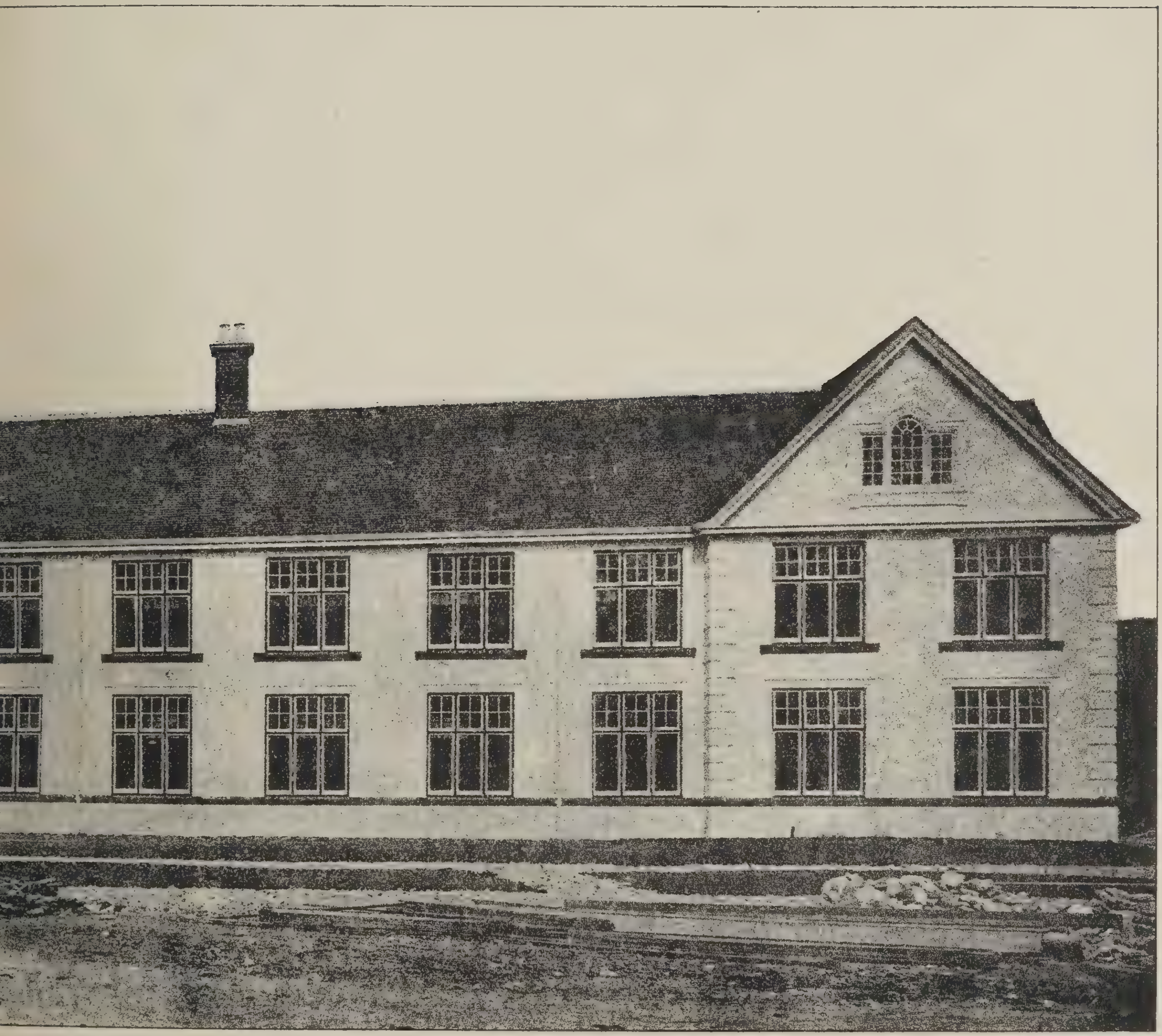


PHOTO: E. DOCKREE

SANATORIUM, WINSLEY,



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OCK & REAY, ARCHITECTS.

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WINSLEY SANATORIUM: THE CORRIDOR. (*Photo: E. Dockree.*)

two blocks. The plans of the building have been prepared by Messrs. Silcock & Reay, of Bath, the builders being Messrs. J. Long & Sons, of Bath; Mr. E. J. Trotman acting as clerk of works. The contractors for the electric lighting were Messrs. Edwards & Armstrong, of Bristol. The total cost of the building and site has been about £10,000.

Although the ceremonial opening of the sanatorium has been postponed in the hope that the King or another member of the Royal Family may be induced to be present, patients are already in residence.

Sir Caspar Purdon Clarke, C.I.E., F.R.I.B.A., Director of the Victoria and Albert Museum, South Kensington, who leaves for New York in September to take up the Directorship of the Metropolitan Museum of Fine Art in that city, won the National medallion for architecture at the end of his three years' course and was engaged in the Office of Works, at the Houses of Parliament, and afterwards transferred back again to the Works Department at South Kensington Museum, where, as an assistant architect, he worked not only on the plans of the new buildings but on those of Bethnal Green Museum and of consular and Embassy buildings for the Far East. In 1876 he was made one of the architects for the Royal Commission of the Paris Exhibition in 1878. Later, in addition to his museum duties, he was engaged for the "Fisheries," "Healtheries" and Indian Exhibitions, at the last of which he designed and built the Indian city. The Indian Section of the Paris Exhibition of 1892 was also arranged by him.

NOTTINGHAM ARCHITECTS AND REGISTRATION.

At their last meeting the Nottingham Architectural Society discussed the question of architects' registration.

Mr. A. W. Brewill, F.R.I.B.A., the president, said the Registration Committee of the Institute were getting on very well with the Bill that was being drafted, and as far as possible all points of difference were being eliminated, so that nothing should stand in the way of its passage. If in that manner the thin end of the wedge towards ensuring that all persons practising as architects should be trained and properly qualified men could be got in, all the other matters that they would like to see brought about might follow in due course.

Mr. A. W. S. Cross, F.R.I.B.A. (London), who opened the discussion with the object of eliciting any suggestions that might be likely to prove of assistance to the Committee, freely criticized the work of the Institute, what it had accomplished and where it had failed, particularly in regard to its indifferent attitude to registration, and afterwards emphasized the necessity of the adoption of a Bill which would put a stop to further increase in the number of incompetent practitioners. If such a Bill were to become law, and an effectual and final check were put on the flow of hordes of illiterate and incompetent men who were now overwhelming the legitimate practitioners by sheer force of numbers, the art of architecture would unquestionably benefit. Under a wise scheme of registration the average architect of the future should be a man of sound general education and culture, and as such he would recognize that he was a member of a great and honourable profession. He would know that all unprofessional or dishonest conduct would meet with prompt and exemplary punishment, and, owing to his early associations with many of his fellow practitioners, he would be possessed of what they as a profession sadly lacked, namely, a strong feeling of *esprit de corps;* while although he might show by his designs that he possessed neither great creative power nor originality, yet, on account of his technical scholarship alone, his works would be far more likely to stand the test of time than those produced by an illiterate and imperfectly trained man with, perhaps, far greater natural gifts. The great architects of the future would be men possessing special aptitude for the profession, whose inborn ability had been carefully nurtured and systematically trained, and such men could not fail to produce works of a far higher standard of art than those emanating from the architects of to-day, whose technical training had been obtained, in the majority of cases, in a haphazard and inco-ordinate manner.

Compulsory Examination.

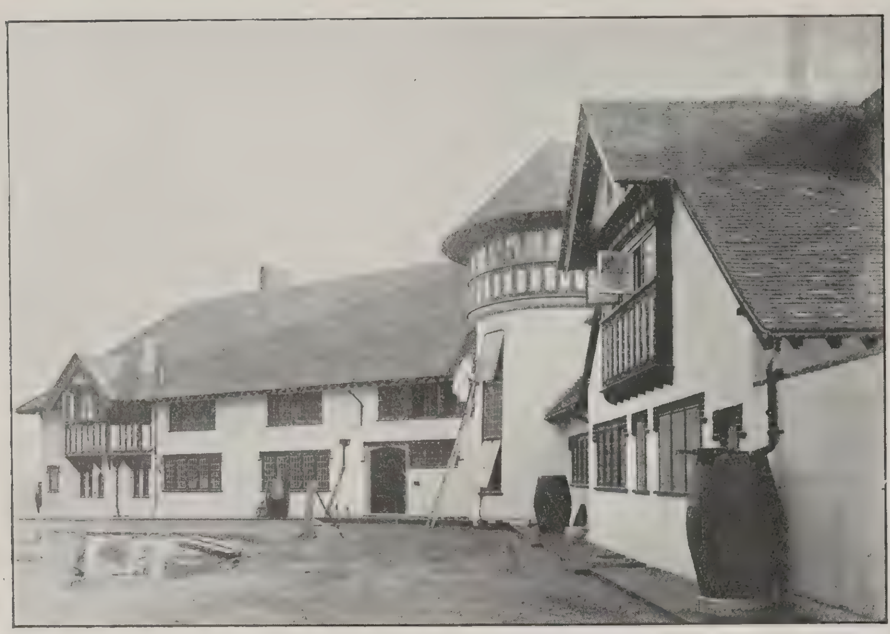
Mr. G. Hubbard, F.R.I.B.A. (London), observed that the necessity of a Bill for the registration of architects must have become apparent to all who had the interest of the profession at heart. It was well known that the profession was constantly being recruited from the untrained and incompetent, and both for the sake of architecture and the properly trained man steps should be taken to foster the one and protect the other. That could only be done by compelling those who aspired to practise to prove their qualification before being allowed to do so. Experience taught them that when the voluntary examination for the associateship of the R.I.B.A. became compulsory in 1882 there was an immediate rise in the number of candidates, and there could be no question of the superior class of men who had joined the Institute and of the superior quality of their works. If they took that as a guide they should feel encouraged to promote in the whole profession a similar state of affairs, for compulsory examination had encouraged candidates to study the art they intended to practise with a great access of competence to themselves and of dignity to the art of architecture. What held good for the few might be fairly assumed to apply equally well to the many; where all were trained, the access of competence and dignity must be in like proportion, and a general application of the principle in their profession would result in a selection of the fittest. The trained architect alone knew how to make his art respond to his impressions, and it ought to be their work to place the profession in the high position it ought to occupy and to induce men of standing and education to join its ranks, so that it might go down to their sons safe from the debasing influences of the ignorant and incompetent. Without statutory qualification, however, it was impossible to carry out those high ideals.

A general discussion followed, during which Mr. A. N. Bromley, F.R.I.B.A., voiced the feeling of the bulk of the members in favour of the general principle of registration; indeed, he remarked, it was difficult to understand why the Institute had been so consistently opposed to it.

The president said that the question had made rapid progress during the past year, and the Bill would have very little real opposition throughout the country, particularly amongst provincial architects, to whom the matter was more vital than to their London brethren.

A resolution was passed supporting registration and hoping that the Institute would prosecute the early adoption of the Bill.

Subsequently the annual dinner of the Society was held.



Entrance Court.

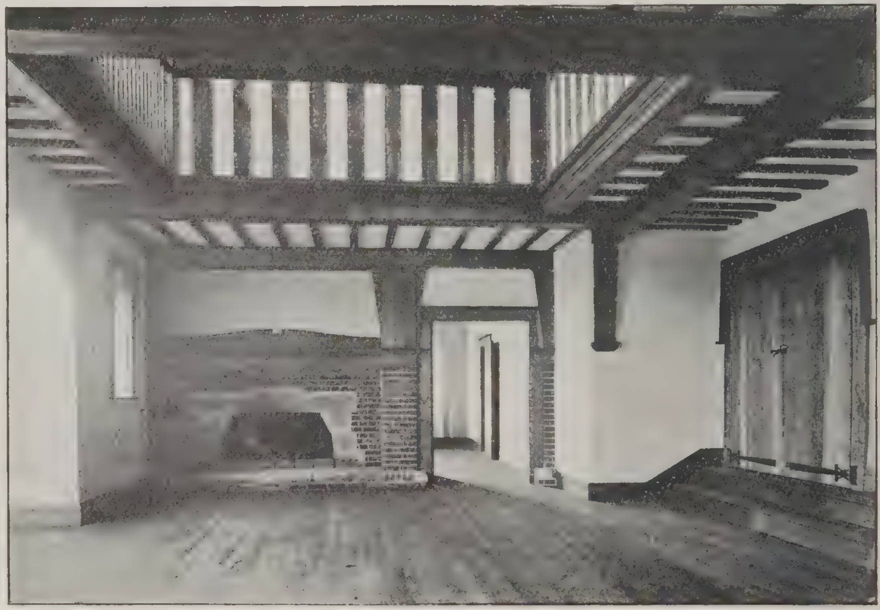
THE GARDEN HOUSE, SALTWOOD.

PARTICULAR interest in this house will be evinced by the fact that it is the outcome of a BUILDERS' JOURNAL competition held some years ago. In that competition the design by Mr. John W. Rhodes, of Mitre Court Chambers, Temple, E.C., was selected, and he was afterwards asked to carry out the work, with numerous alterations to suit the client.

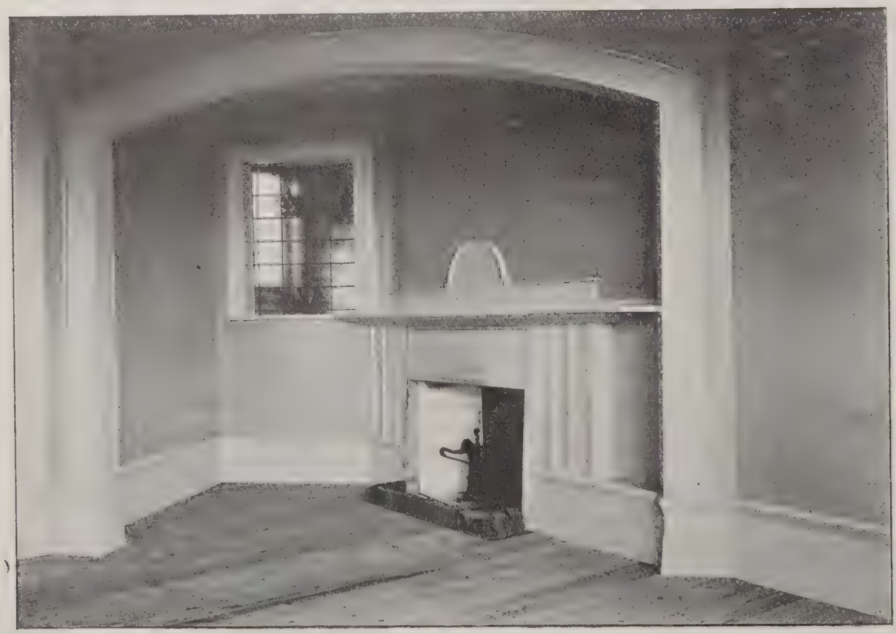
The site commands extensive views over the English Channel from Dungeness to Folkestone. It is about $2\frac{1}{2}$ miles from the sea, and adjoins and overlooks the well-known American garden which is in the same ownership. The new gardens (comprising six acres) are being laid out broadly to the architect's design. Abundance of excellent water was found on the estate, and pumping is effected by a "Petter" oil-engine. The main buildings, stable and outbuildings are all built with selected grizzles, the stone plinth shown to the house in the geometrical drawings (see centre plate) being omitted on the score of economy. All exterior walls are thrice coated with a special limewhite and tallow dressing. The roofs were originally intended to be reed thatched, but the stable only has been covered in this way, old selected tiles taken from demolished houses in Dover being used for the remainder. This necessitated some alterations in the original drawings of roof plans. The principal rooms face south-east and south-west. All the oak doors, architraves, &c., on the ground floor were cut from old mill-posts, the long strap hinges and latches being in wrought-iron. The boudoir is heated by a hanging-basket, and the remaining best rooms by well-fires with stone, red brick or wood mantels. All these fittings are to the architect's special design. The illuminant throughout is acetylene gas, and is most successful. The works have been carried out by Mr. Charles Rice, of East Grinstead, Sussex.

OLD PLASTERWORK IN DUBLIN.

IN the course of a paper on this subject which he read before the recent convention of the Master-Painters' Association of Ireland, Mr. Howard Pentland, B.A., F.R.I.B.A., said he knew of only one example of plasterwork in Dublin in which Wren was concerned, and that was the ceiling of the chapel at the Royal Hospital, Kilmainham, an institution like the Chelsea Hospital, now partially occupied by the Commander



Hall, looking towards Dining-room.



Boudoir Mantel.

Dining-room Door.

THE GARDEN HOUSE, SALTWOOD NEAR HYTHE, KENT. JOHN W. RHODES ARCHITECT

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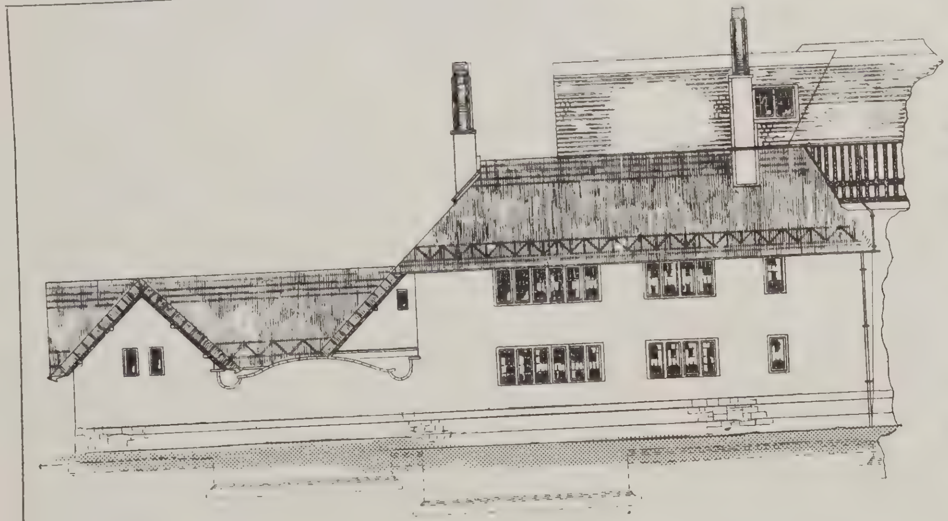
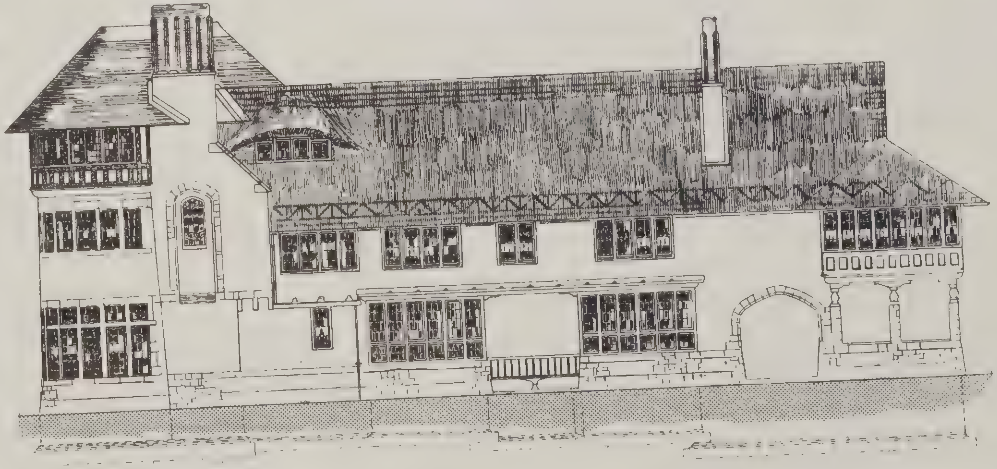
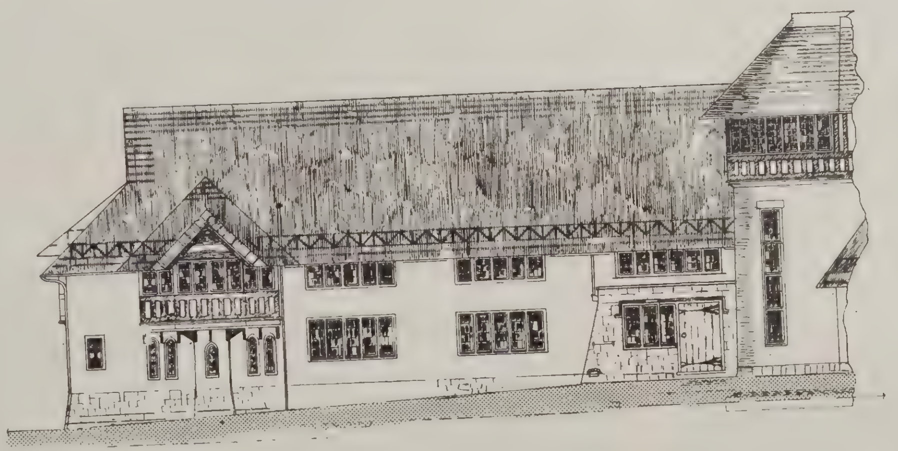
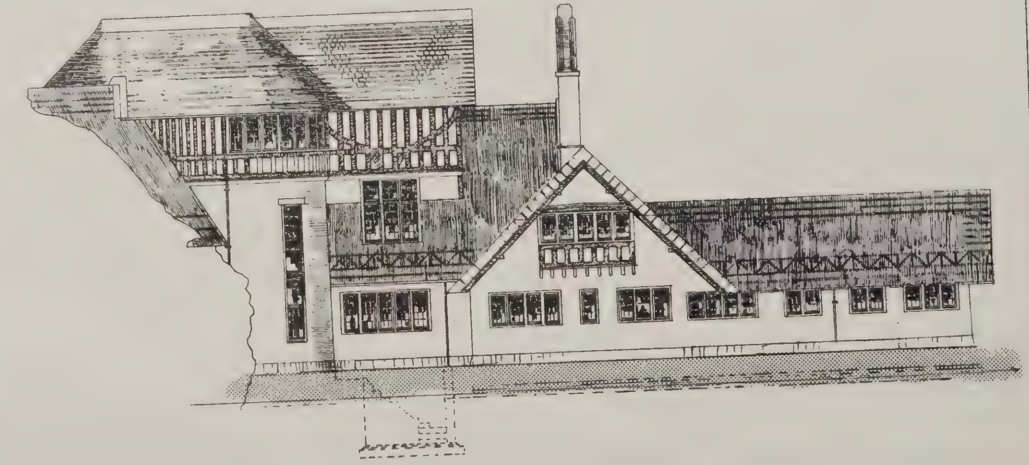
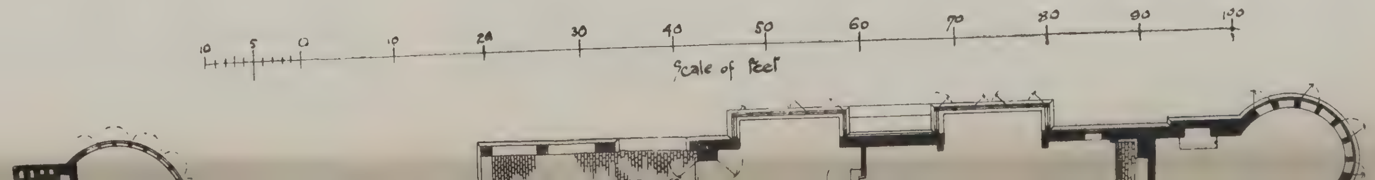
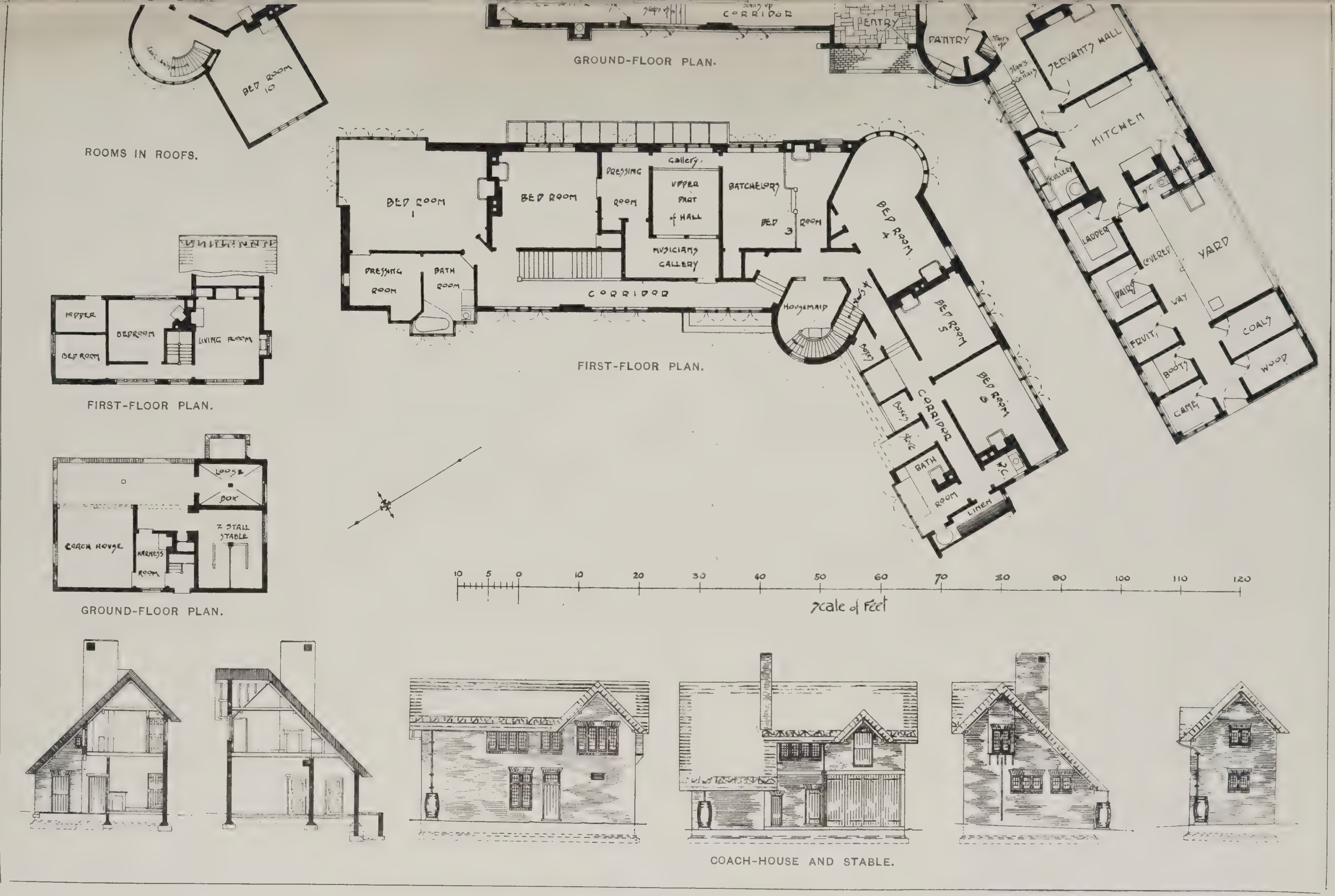

SOUTH ELEVATION.


SOUTH-EAST ELEVATION.


NORTH-WEST ELEVATION.


NORTH ELEVATION.




ROOMS IN ROOFS.

GROUND-FLOOR PLAN.

FIRST-FLOOR PLAN.

FIRST-FLOOR PLAN.

GROUND-FLOOR PLAN.

COACH-HOUSE AND STABLE.

THE GARDEN HOUSE, SALTWOOD, KENT. JOHN W. RHODES, ARCHITECT.

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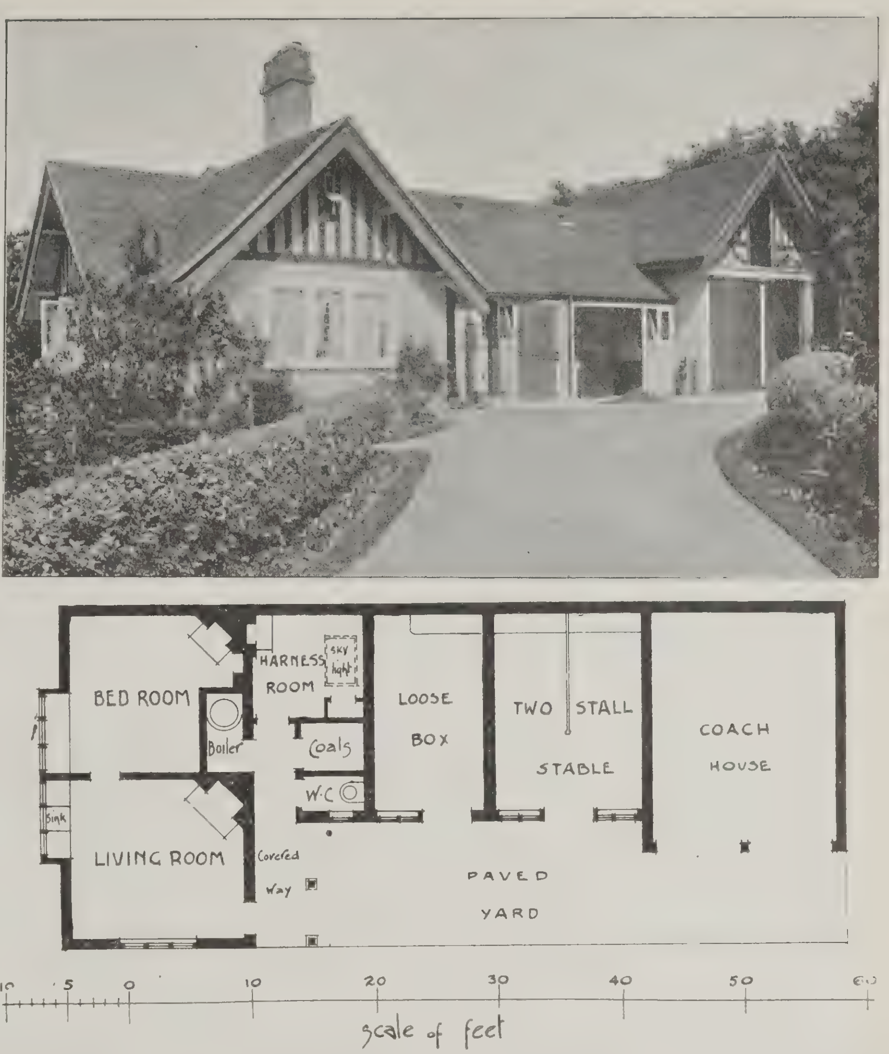
of the Forces and his staff. Gandon, the architect of the Dublin Custom House (commenced in 1781), stated that the design of the Royal Hospital had been attributed to Inigo Jones, but he pointed out that as the latter died in the middle of the seventeenth century, and the Royal Hospital was commenced towards its close, this was rather unlikely. Sir Thomas Drew and the late Mr. Penrose had since ascertained that the design was due to Wren. Sir Christopher did not go to Dublin to superintend the execution, and, as with Sir William Chambers' designs for Trinity College and Charlemont House, there were doubtless many stupid misinterpretations and ill-advised alterations and additions. Still more unlikely was the current belief that the plaster decoration of the ceiling of the chapel was modelled by Cipriani. Cipriani was much more of a painter than a sculptor, and belonged to the latter half of the eighteenth century. In his younger days he did some work for Lord Charlemont at Clontarf, and probably at Charlemont House, and in later years he was associated with Angelica Kauffmann and her husband, Antonio Zucchi, who were largely employed by Robert and James Adam in painting the panels of their ceilings. The modelling of the plaster details was, as a matter of fact, often entrusted to Pergolesi. The ceiling of the chapel at the Royal Hospital was distinctly of the school of Grinling Gibbons and Caius Cibber, full of exuberant, naturally treated, deeply under-cut foliage, fruit and flowers, and as far removed from the enervated modelling which usually set off the panel painting of Cipriani, Kauffmann and Zucchi as it would be possible to imagine. Referring to a ceiling in the house of Mr. David La Touche on Stephen's Green, built in 1794 and occupied for many years by the Representative Church Body, Mr. Pentland said he did not know whether any of the three painted its panels or not, but Angelica Kauffmann painted panels in the house. If Grinling Gibbons had lived till 1794 he would not have done that kind of plasterwork, refined though it undoubtedly was. Rococo influences were now at work, and soon began to show their mark on the freer Palladian treatment of the old Roman acanthus scroll ornamentation which developed out of the leafage around the Corinthian capital. There was an example in plaster in the Stephen's Green Club. It was hard to say whether it was vegetation posing as architecture or architecture posing as vegetation. The style of it was generally known as the pigtail and periwig style.

Mr. Pentland next considered examples of plasterwork at Dublin Castle, comparing the reception-room ceiling with a rather similar rococo ceiling in the celebrated Buck Whaley's house on Stephen's Green, now the Catholic University. Other examples of old plasterwork dealt with by the lecturer were ceilings at a building in the neighbourhood known as La Touche's Bank and now used for official purposes, at 6, Upper Merrion Street, and at Trinity College, Leinster House, Kildare Street, occupied by the Royal Dublin Society. Coming to a "tremendous departure," Mr. Pentland referred to the work done by James Wyatt, the London architect, for the second Duke of Leinster. Wyatt was following in the footsteps of the celebrated Robert and James Adam, and under his direction the "long room" was redecorated in the now popular and fully developed Adam style. This was used as the library of the Royal Dublin Society, but when the National Library was built the plasterwork was carefully scraped and repaired, Wyatt's colouring being followed as closely as possible by Messrs. H. Sibthorpe & Son from some original drawings. Further examples dealt with by the lecturer included staircases, doorways and ceilings from the Rotunda Hospital, chapel and rooms; Drogheda House, Upper Sackville Street, now occupied by the Hibernian Bible Society; Charlemont House, on Rutland Square, the office of the Registrar-General; Mornington House; Clanwilliam House; Ely House, now the residence of Sir Thornley Stoker, M.D.; Belvidere House, No. 6, Denmark Street; and No. 17, St. Stephen's Green.



The brickwork is in hard-burnt grizzles, covered with cement rough-cast, and the roof covered with local tiles. Granolithic paving was laid by Messrs. Ward & Co. Mr. Charles Rice, of East Grinstead, was the contractor. Mr. Rhodes acted in conjunction with the surveyor to the Dorman's estate, Mr. W. C. May.

STABLES, DORMAN'S PARK, EAST GRINSTEAD, SUSSEX. JOHN W. RHODES AND W. C. MAY, JOINT ARCHITECTS.

THE GARDEN HOUSE SALTWOOD: VIEW FROM DRIVE.

Law Cases.

When a Bricklayer is not a Bricklayer.—At the Birmingham County Court last week a bricklayer named Nicholls applied under the Workmen's Compensation Act for compensation from William Bishop, builder, of King's Heath, for the loss of a finger through an accident which occurred while he was engaged in moving a girder on January 2nd. The case for the applicant was that on the Thursday and Friday before the date of the accident the severe weather prevented Nicholls from working as a bricklayer. On the Saturday he went to the works to draw his wages. The foreman met him and said, "Give us a hand with this girder." He did so, and the girder slipped, with the result that his finger was crushed. His honour Judge Whitehorne held that the man's employment was that of a bricklayer, and that there was no evidence to show that the accident arose out of his employment. He therefore dismissed the claim, with costs. But he said he should be glad to have the point settled by a higher Court.

Obituary.

Mr. Alfred Stearn, head of the firm of Messrs. Alfred Stearn & Son, builders, Ipswich, died recently in his seventy-third year. During the last two or three years, however, Mr. Stearn had not taken any active part in the conduct of the business, which has devolved upon his son, Mr. Edward Stearn.

NEW BUILDINGS IN SOUTH AFRICA.

SUPPLEMENTARY to the illustration and particulars of the new town hall and municipal buildings for Durban which we published last week, we now give some views and particulars of other new buildings in South Africa, for which we are also indebted to the "British and South African Export Gazette."

New Railway Stations at Durban and Pietermaritzburg.

The new railway station at Durban has recently been raised from two storeys to its present height and is built of brick and Bath stone; attention is drawn to the fact that the sign-board over the main entrance is no part of the architects' scheme, though by the illustration one might at first sight suppose it were an absolute subjection to the claims of the advertiser! While referring to this building we may state that the same firm of architects designed the new railway station which has just been completed at Pietermaritzburg at a cost of £35,000. In Pietermaritzburg also the erection of a new general post and telegraph office for Natal (from designs by Mr. W. Lucas, selected in competition) is in hand, at an estimated cost of more than £100,000.

Business Premises in Johannesburg.

The accompanying illustrations of the new premises in Johannesburg for Messrs. J. W. Jagger & Co. and Messrs. Eckstein & Co. and the National Bank, Ltd., serve to show the class of buildings which are now being erected in South African towns. Messrs. Jagger's premises were the first to be erected in Johannesburg on the steel frame principle. Messrs. Eckstein's are now being completed and will be opened within the next month or so.

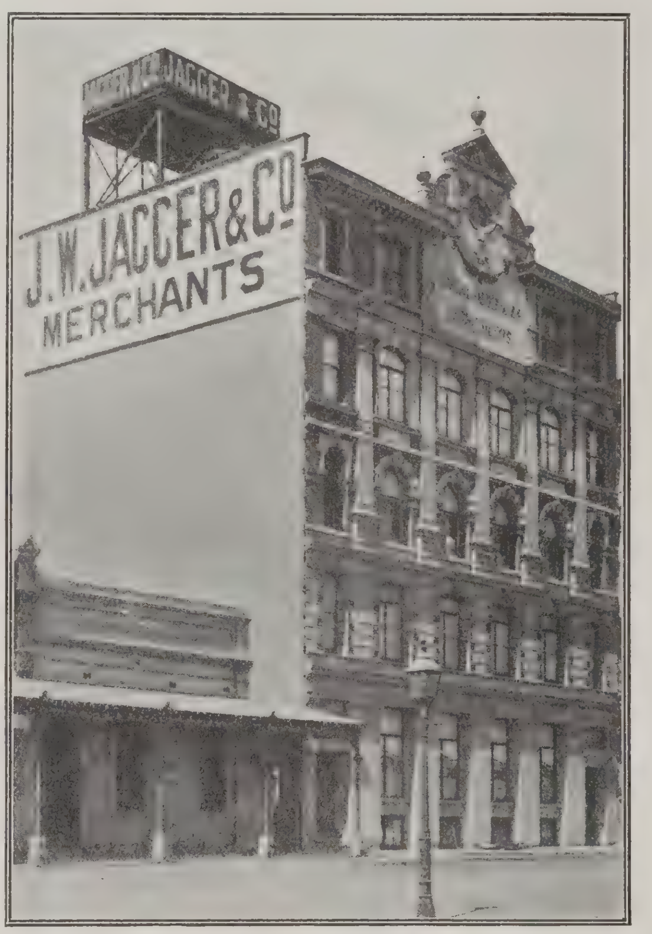
New City Hall and Municipal Buildings, Cape Town.

In Cape Town vast alterations have been made in recent years. Of the numerous buildings now being erected there, the most important is the new city hall and municipal buildings, rapidly approaching completion. The building is Italian Renaissance in style, and consists of three storeys, with a clock-tower and belfry 200ft. in height. It faces the Parade Ground and contains, in addition to the usual municipal offices, a large council-chamber, library, banqueting hall and a grand city hall, the last-named being equipped with a large organ and being capable of accommodating about 6,000 people when necessary. The dimensions of the hall are 130ft. by 62ft. and 55ft. in height. A statue of King Edward VII. is to be erected opposite the main portico. Messrs. H. A. Reid and F. G. Green are the architects. Other public buildings under construction, projected, or only recently finished in Cape Town are the new offices of the Table Bay Harbour Board and Customs House and the Chamber of Commerce in Adderley Street, and the Cape University buildings (overlooking the Botanical Gardens), the design for which, by Mr. W. Hawke, A.R.I.B.A., was illustrated in THE BUILDERS' JOURNAL for May 27th, 1903.

While giving these particulars of new buildings in South Africa we may quote the following interesting remarks from the "British and South African Export Gazette" of January 5th, which also contains portraits and particulars of the leading architects practising in South Africa, a list of whom is here subjoined.

A Revolution in Colonial Building Styles.

Within a few decades a complete revolution has been effected in South African styles of architecture. Less than half a century ago the Dutch type of building—spacious, two-storeyed, flat-roofed, quaintly gabled, with whitewashed or stuccoed front, and the inevitable stoep running along its entire length—prevailed in town and country, alike in the Cape Colony and the Dutch Republics, save where the early Victorian barracklike structure of the merchant firm, and the primitive "tin" shanty of the storekeeper or trader, had gained a footing. Even in Natal the "tin" hut was in general service until the more recent stone building of semi-bungalow type, slightly suggestive of the Orient, became characteristic of the Garden Colony. Now, however, the unpretentious structures of earlier days are rapidly disappearing from the larger centres, and in their place—sometimes, even at Johannesburg, cheek by jowl with their few survivors—stand the palatial public and commercial edifices, the towering steel-frame "sky-scrapers," the imposing churches, and the suburban villas.



THE FIRST STEEL-FRAME BUILDING ERECTED IN JOHANNESBURG.

South Africa's Cosmopolitan Architecture.

It cannot be said that the history of South African architecture constitutes a record of the evolution of type out of type upon a distinct line of development, as has been the case in many of the countries of the Old World. In fact, South Africa—and considering its brief history this is by no means remarkable—has never had a distinctive style of its own, but has adopted, and superimposed upon each other, with very little modification, the national types of its successive inhabitants. Thus the quaint and picturesque Dutch houses became intermingled with the ugly Georgian and early Victorian buildings of the English Colonists, while each of these is being superseded by all that is striking in the very cosmopolitan architecture of the great cities of Europe and America to-day. This latest change is an effect of the sub-continent's close commercial contact with the great manufacturing countries of the world, and of the wonderful growth of its import trade.

The Importation of Bath Stone.

During recent years the South African architect has experienced great difficulty in obtaining suitable materials for his buildings. For years he had to make the best use possible of second-rate locally-made bricks, or, when within moderate distance of a quarry, was able to employ Colonial stone, most varieties of which are very difficult and expensive to work. During recent years, however, the best English stone has been available, notwithstanding transport and other difficulties, and it is being specified by architects more and more freely in spite of the movement afoot in South Africa for the development of the Colonial quarrying industry. The firm which has done pioneer work in the employment of English stone is that of Messrs. Jesse Smith & Sons, of Natal, who were importing Bath stone nearly twenty years ago. It is only, however, within the last ten years that the shipment of this stone has become a regular feature of Anglo-South African trade.

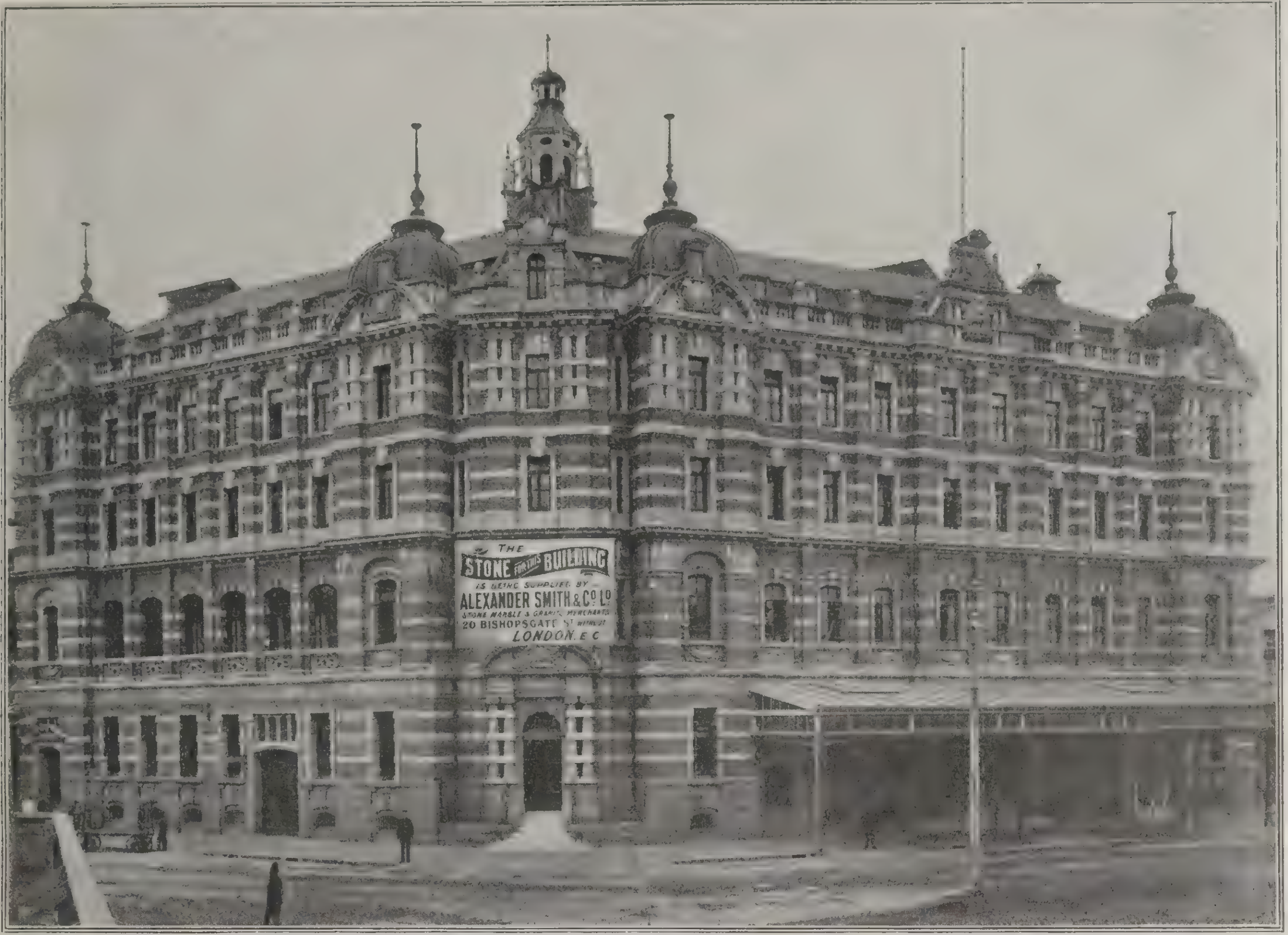
Mr. Alexander Smith, a nephew of the original Jesse Smith, says the average cost of Colonial stone is about 4s. per cub. ft., whereas he can land Bath stone at Cape Town or Durban for 3s. 4d. and less.

The difficulties which make it more profitable to carry stone like this over 7,000 miles are—the lack of railway transport from the South African quarries, and the trouble involved in working the local stone, which is largely granite and sandstone, and so hard that it cannot be sawn by Kaffir labourers (as Bath stone can) but must be carefully worked by a skilled white man. Further, the great delays and uncertainty of obtaining regular and prompt supplies of stone from the quarries is often a very serious and costly matter to contractors employing, perhaps, twenty to thirty masons at wages of 15s. to 20s. per day. "The consequence is," says Mr. Smith, "that, in addition to being obtained at less first cost than the South African, English stone also involves an economy of nearly 50 per cent. in working expenses."

South African Architects.

The leading architects now practising in South Africa are:—*In Cape Colony:* Mr. F. G. Green, A.R.I.B.A., Mr. W. White-Cooper, M.A., F.R.I.B.A., Messrs. MacGillivray & Grant, Mr. C. H. Smith, A.R.I.B.A., Mr. M. J. Harris, M.S.A., Messrs. W. H. P. Black, F.R.I.B.A., and H. Black, A.R.I.B.A. *In Natal:* Messrs. Read & Hurst, Mr. W. Lucas F.R.G.S., F.R.V.I.A., Messrs. C. H. Stott, M.S.A., & R. G. Kirkby, A.R.I.B.A., Mr. Robert S. Clark-Walker, C.E., and Mr. Robert Harvey. *Transvaal:* Mr. H. A. Reid, M.S.A., J.P., Mr. H. Clayton, M.S.A., Messrs. A. H. Reid, F.R.I.B.A., & W. Reid, Mr. Redcote Dewar, Messrs. A. L. & A. Klute, Mr. A. E. Duguid, Mr. David Ross, F.R.I.B.A., Mr. J. Innes Murray, Mr. A. Phipps Coles, M.S.A., Mr. S. D. Le Roux, and Messrs. W. A. de Rapper & Son.

Members of the profession here will doubtless be interested in looking over the above list, among which will be found many names familiar to them, for most of the architects now practising in South Africa went out from this country.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NEW RAILWAY STATION AT DURBAN. STREET WILSON AND PATON, ARCHITECTS.

THE ARCHITECTURAL ASSOCIATION.

Two Papers on Byzantine Architecture.

A MEETING of the Architectural Association was held at 18, Tufton Street, Westminster, on Friday evening, Mr. E. Guy Dawber, F.R.I.B.A., presiding.

Messrs. J. K. Ground (Maidstone), S. A. Whitehead (Sidcup), R. M. Kelly (East Sheen), H. D. Ward (Grays) and H. E. Bunce (Upper Clapton) were elected members of the Association. It was announced that Mr. Christopher M. Shiner, Mr. Ellis Marsland, Mr. Cyril E. Power and Mr. C. S. Yates had rejoined the Association.

The president stated that the following additional donations to the Building Fund had been received :—

	£	s.	d.
Charles Morrison - -	100	0	0
Walter Cave -	10	10	0
A. Potter - -	10	0	0
W. Bagaley & Sons	5	5	0
Hayward & Wooster - -	5	5	0
ames Lemon -	5	5	0
. H. Pye - -	5	5	0
Gill Brothers -	2	2	0
J. Parnell & Son	2	2	0
Alfred East, A.R.A. - -	1	1	0
Higlett & Hammond - -	1	1	0
F. J. Lloyd - -	1	1	0
J. R. Moore-Smith - -	1	1	0

A vote of condolence with the widow and relatives of the late Mr. Thomas Blashill was passed.

Papers on Byzantine architecture (illustrated by numerous excellent drawings and photographs, and by lantern slides) were then read by Mr. J. B. Fulton and Mr. E. F. Reynolds.

Mr. Fulton's Paper.

Mr. Fulton said it would be an interesting study to trace the influence of early Roman building down to the Byzantine period. The nfluence was evident, as the architects must have visited Rome and there studied the great temples and baths; but the Romans, with all their power of knowledge in construction and imagination in design, could never have built Santa Sophia.

Mr. Fulton said he wished to show some examples of Byzantine architecture — examples well-known but not one-half appreciated, as we did not fully realize the beauty and truth of construction in this style.

Examples at Constantinople.

At Constantinople there were the churches of SS. Sergius and Bacchus; S. Theodore, Tyrone; S. Theodosia (now Gul-Jami); and the church of the Monastery of the Chora (now Kahriych Jami)—and the great Santa Sophia.

Originally there were two churches of SS. Sergius and Bacchus. "The existing one is a gem and is in a wonderful state of preservation. The dome is supported by eight piers, the arches forming an octagon, but below the arches the angle sides of the octagon are semi-circular recessed, and it is these recesses which give to the interior such a charm."

S. Theodore, Tyrone, Mr. Fulton considered unworthy of the best traditions of the style, as although the façade in itself was good, the plan was false, being that of a Greek cross. The columns supporting the dome seemed rather weak.

The plan of S. Theodosia was interesting; the whole effect of the interior was achieved by form, there being no detail.

The façade of the church of the Monastery of the Chora was thought to have served as a model for St. Mark's, Venice. The glory of this church was its decoration. There we saw what the Byzantine architects were aiming at—true architecture, which meant the unity of the three arts. Constantinople was well worth a visit to see these mosaics alone, even though they had suffered by fire and earthquakes. The figure of St. George in the outer narthex, said Mr. Fulton, was undoubtedly the finest study in mosaic that he had ever seen.

In SS. Sergius and Bacchus we saw the germ of the Byzantine style; in Santa Sophia the idea fully developed. It was said the exterior of Santa Sophia possessed little architectural beauty, and he thought this impression was due to the stucco with which the original material was covered: he suggested taking away the stucco, the minerets, buttresses and innumerable small Turkish buildings, which were out of harmony with the main building. "Now look at the design with all these removed, see the great buttresses, the arch between, the semi-domes and great dome rising from the square base. Is it not a magnificent pile?" The passion and mystery was marvellous. No other building could compare with Santa Sophia in beauty, fine proportion and delicate detail.

Examples in Palestine, Asia Minor, Greece and Italy.

Continuing, Mr. Fulton dealt with churches in Palestine, Asia Minor, Greece and Italy.

St. Mary's Church in Bethlehem was one of the earliest Byzantine churches known. The Golden Gate, Jerusalem, was also in this style, but no part of it called for special attention.

In Brusa there were interesting details, such as panels, capitals, &c., but nothing of special note.

Athens had quite a number of Byzantine churches, all comparatively small though interesting. Byzantine churches, in fact, were scattered all over Greece. He mentioned two – the Convent of Daphni, situated about five miles from Athens on the Sacred Way; and St. Luke's, Stiris, which was almost perfect in its general design, lighting and decoration.

In Italy Byzantine art reached a high state of perfection, the glory of the art being St. Mark's, Venice. Its interior could not compare with Santa Sophia, but the façade was the finest example of an exterior in Byzantine art. The Gothic addition in the fifteenth century might have been better; as fine architecture it was not to be compared with the Byzantine building.

Mr. Fulton said he had seen and knew but little of Byzantine domestic architecture. The Palace of Belisarius, Constantinople, was a magnificent example—a decorative study in stone and brick.

Mr. Reynolds's Paper.

Mr. E. F. Reynolds said the founding of Constantinople was sometimes regarded as the starting-point of Byzantine art, but such arbitrary divisions were always misleading, if not altogether untrue. The removal of the capital from Rome to Constantinople doubtless exercised a very deep influence, and the energy of building which it called forth must have quickened architectural development, but it was strictly a development and no sudden change of style. It was historically certain that the new capital was intended by its founder to be a direct continuation of the traditions of the old capital. In the Edict of Dedication its title was "the New Rome"; the general design of the city followed the Roman model, with its forum, its circus, its basilicas, baths and porticos; and its population was drawn from other cities of the empire, and especially from Rome itself. Thus, both by intention and circumstance, Constantinople was essentially Roman in its foundation. But there were also many influences which in their working could not fail to modify this tradition and prevent a mere reproduction of Roman art. The most formative of these were (1) the renewed ascendency of the native Greek genius, (2) the more direct communication with Oriental influence, and (3) the unrestrained play of the new force of the Christian religion.

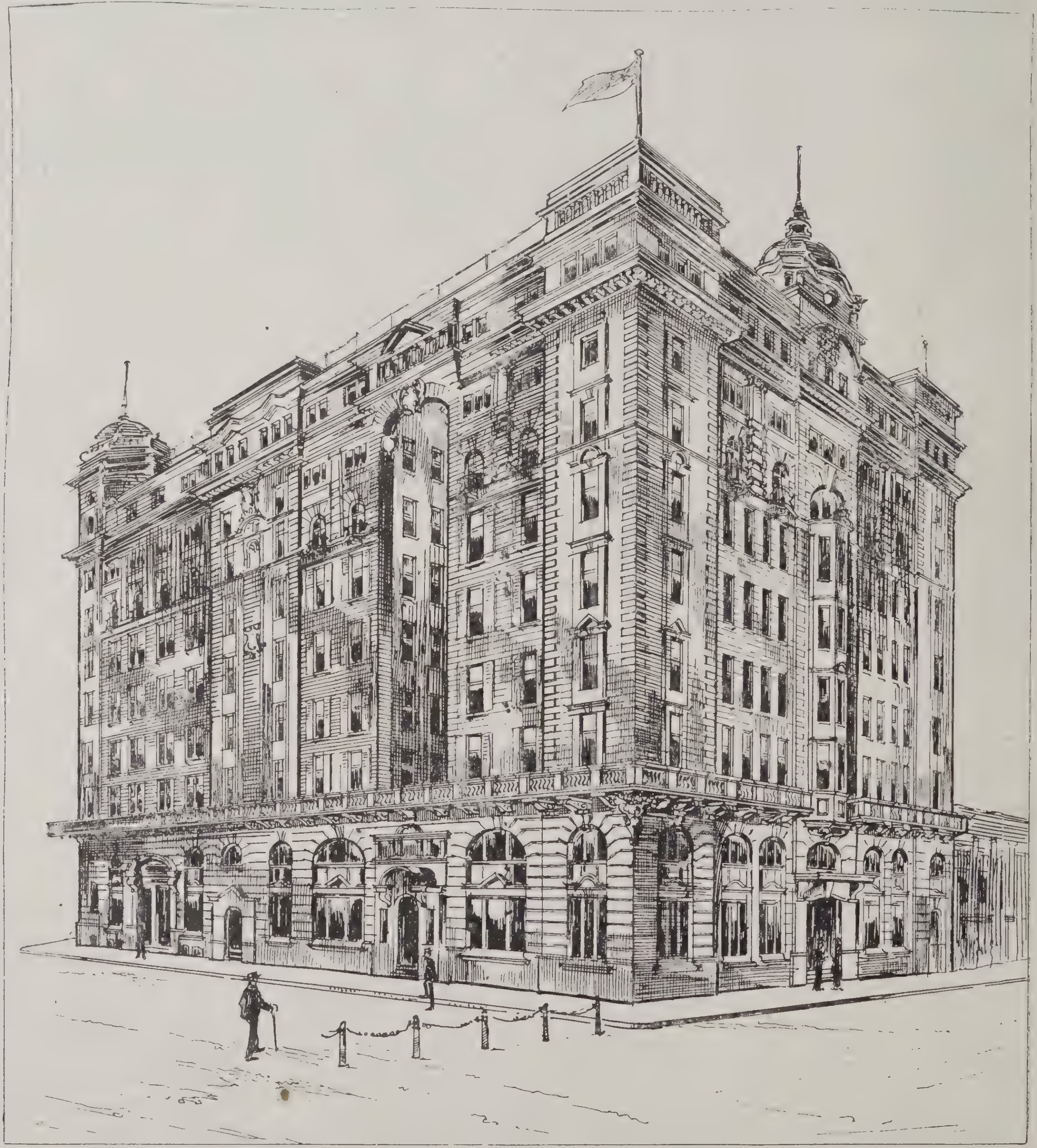
Roman Building and Greek Genius.

The Romans had largely borrowed their decorative art from the Greeks, but an inverse process was now to take place, for while the Byzantines developed that system of constructive design which had formed the real vitality of Roman work, they modified and eventually discarded the unrelated decorative design which had obscured the structural conception. Under Greek discrimination the vital principles of Roman building were disengaged and purified, and decoration was once more brought into intimate relation with structural design.

Eastern Influences.

By the removal of the capital, contact was also established with a more direct Oriental influence. The East had always been the natural home of the vault and the dome, and it was there that the origin of these methods of covering was to be sought. To this Eastern influence, which flowed to Constantinople along the great trade routes, might be attributed that freedom in the use of vault and dome which formed so integral a part of Byzantine design. Moreover, the Byzantine method of vault construction was similar to the Oriental method, the courses being laid with inclined beds and independent of centering, while the Roman construction of ribs and shell was essentially different.

This influence also filtered through Asia Minor, where a local school had already established itself, experimenting with new combinations of plan-form and arriving at the principle of the pendentive. Even the Imperial Roman buildings at Baalbec and Palmyra showed something of the same tendency to break away from the academic style in the substitution of the arch for the lintel, and in freshness of decoration. It seemed as though the meeting-place of



PREMISES FOR MESSRS. ECKSTEIN & CO. AND THE NATIONAL BANK OF SOUTH AFRICA, JOHANNESBURG.

Greek and Oriental formed a kind of hot-bed which fostered the early growth of many forms which afterwards became typically Byzantine.

Changes wrought by Christianity.

Christianity was recognized as the State religion only a short time before the foundation of the new capital, and it was at Constantinople that it found full force of expression. It brought a new inspiration to building, needing fresh forms specially adapted to its ritual and a new mode of decoration explanatory and symbolical of its creed. The perfunctory worship and comparatively insignificant temples of the Roman mythology gave place to an ardent and enthusiastic religion which penetrated and revitalized all the arts. Roman art had in reality been almost purely secular, and its most characteristic monuments had been the fora, the theatres, the baths and, above all, the great works of engineering. But from the rise of Christianity religious building again assumed the lead, and although this was now unduly emphasized by the better preservation of such works, yet there could be no doubt that the prime energy of the Byzantines was devoted to their churches.

These, then, were some of the main factors which determined the difference between Roman and Byzantine work.

Later Development.

Following the new foundation there was a period of 200 years' growth and formation, culminating with the erection of Santa Sophia. The precise course of development during this period could be only imperfectly known owing to the destruction of so many ntermediate buildings. Constantinople had especially suffered from the violence of its earthquakes and the still greater violence of ts riots. But phases which were missing here might sometimes be found in such affiliated centres as Ravenna and Salonica, while a comparison of the developed Byzanine forms with the embryo ideas of late Roman work often suggested the source from which that development sprang.

Plan-Forms of Santa Sophia.

Mr. Reynolds proceeded to give a study of he plan-forms of Santa Sophia, tracing some of the earlier forms from which they seemed o have been derived. The uniqueness and originality of the church lay in the combination of two types of plan which hitherto had been developed more or less separately. These might be distinguished by the terms “basilican” and “radial,” the basilican type being founded on a repetition of bays in length, the radial type being founded on a epetition of bays around a common centre, producing circular or polygonal figures. The ssential parts of the scheme of Santa Sophia were (1) a central square bay, defined by our arches set on piers and covered with a ome on pendentives, and (2) two complex pses, applied to opposite sides of the central quare and regulated by its arches. Of these wo principal parts, the first might be traced o a basilican origin and the second might e derived from the radial type of plan.

The Roman Use of Domes.

The Romans had always applied the dome o circular or octagonal ground plans, and nly in the latter case was any transition f plan-form necessary. In the baths of aracalla there was an instance of an ctagonal hall covered with a circular dome, nd the transition was made by means of orbelling, which formed a slight pendentive; ut the full development of the pendentive as essentially Byzantine, and seemed to ave originated in the East rather than the West.

Spherical Vaults.

The spherical vault—such as that used in he tomb of Galla Placidia at Ravenna—as intimately related to the dome set on endentives, but it afforded no opportunity admitting light, and in buildings of a larger scale this led to the raising of the upper part of the vault so as to form a separate dome, and eventually to the raising of the dome itself on a drum.

The Greek Cross.

Plans in the form of a Greek cross naturally resulted from the use of a central square bay set on arches, the arms of the cross representing the depth of abutment necessary to those arches; and the generalized form of plan was of very early origin and of almost universal use. The Romans were familiar with it, and it was supposed that its Persian tradition was imported in the cruciform mosques of Cairo. This type of the Greek cross formed a most important chapter in the history of Byzantine planning; for with the application of the dome to the central square the constructional meaning of the plan was extended to the vaulting, the barrel-vaults over the arms providing abutment to the thrust of the dome.

In dealing with the radial type of plan Mr. Reynolds said

The Pantheon of Rome

might be taken as a convenient starting-point. The structure consisted of a great spherical dome set on a circular drum, and the arrangements for supporting the weight of the dome and abutting its thrust contained the germs of many principles which were afterwards developed by the Byzantines. The wall of the drum was of great thickness, in order to oppose its depth against the spreading of the dome; but the weight and thrust were concentrated at regular intervals, so that the structure of the drum was not continuous but grouped into piers and connecting walls, giving a series of recesses between the piers. The compound wall of the Pantheon represented an intermediate phase between the simple wall of the circular cella and the later development of aisles.

A further Link

was furnished in the so-called Temple of Minerva Medica. Here the articulation of the drum-wall into voids and solids was more perfectly attained, the sides of the octagon being deeply recessed into apsidal chambers or exedræ. Above this lower octofoil stage an octagonal drum was raised, pierced with clearstory windows and strengthened with buttresses, the dome springing above the arches of the clearstory, and the drum-wall being carried up externally. In this instance the semi-circular chambers were separate from one another, and the next step was to connect them together by openings through the bases of the buttresses—thus forming abutment-aisles similar to those which had already been developed in the basilican plan. This was virtually effected in S. Vitale at Ravenna, where the plan-form of Minerva Medica was repeated and surrounded by an aisle, the exedræ being converted into arcades so as to open aisles and octagon into one area.

Thrusts of Dome and Octagon.

But it was necessary to differentiate between the thrust of the dome (which required continuous abutment) and the thrust of the arcaded octagon (which required abutment only at its angles). The function of the aisles in S. Vitale was to sustain the outward pressure of the eight arches which supported the weight of the dome, and to give rigidity to its base. But the actual thrust of the dome was met by the same method as was used in the Pantheon, *i.e.*, by the carrying up of the drum-wall above the springing, thus absorbing the thrust by vertical weight instead of by horizontal abutment.

Santa Sophia and S. Sergius.

Returning again to the plan of Santa Sophia, Mr. Reynolds said it was at once evident that the elaboration of the apses was directly derived from such a design as the church of S. Sergius. There was the same alternation of curved and rectangular forms, the same arrangement of arcading in two heights; and Santa Sophia had more than once been described as the two halves of S. Sergius separated by a central square.

But in adapting the forms of S. Sergius to the apses of Santa Sophia several alterations were made: firstly, the three bays were disposed around a semi-circle, so that no modification of plan was necessary to pass upwards to the semi-dome; secondly, the semi-domes of the apses were not placed above the arch-heads of the three bays, but sprang from the same level and were interpenetrated by them. The reason of this last modification lay in the very different scale of the two churches. S. Sergius was a comparatively small building, and the abutment of its dome was sufficiently secured by the weight of wall carried above the springing and by the buttresses applied to that wall; but the apses of Santa Sophia were tremendous constructions of 103ft. diameter, and the same methods would have been a clumsy expedient on so great a scale. The interpenetration with the lesser semi-domes and barrel-vault of the three bays gave efficient abutment to the great semi-domes at the critical point of their curvature, and, furthermore, reduced their weight. This ingenious distribution of thrust was typical of the whole design of the domes and vaults, and the thrust of the main dome itself was expended through the great semi-domes, the lesser semi-domes, and through the vaults of the aisles to the outer walls.

The Final Combination of Basilican and Radial Plans.

Having thus dealt with the two essential parts which made up the main scheme of Santa Sophia—the central square-domed compartment derived from the basilican plan and the two compound apses derived from the radial type of plan—it remained for Mr. Reynolds to speak of the adjustments necessary to their combination. In Santa Sophia the arms of the cross were developed to the north and south by the great buttresses which passed over the aisles and sustained the east and west arches of the central square; but the completion of the figure by similar extensions to the east and west was rendered impossible, owing to the application of the apses with their deeply-curved exedræ. Hence arose the necessity of mainly absorbing the thrust of the north and south arches within the central square itself, and this was effected by the insertion of an inner arch on each of these two sides. These inserted arches carried the main weight of the dome above, while the original square was still recognized by breaks of 3ft. which, to some degree, were decorative rather than constructional.

Discussion.

A discussion followed in which Mr. R. Phené Spiers, Prof. W. R. Lethaby, Mr. R. Weir Schultz, Mr. Theodore Fyfe, Mr. Dawber and Mr. Fulton took part.

The president announced that the next meeting would be held on February 10th, when Mr. C. S. Spooner would read a paper on "Church Fittings."

The Municipal Engineer's Specification No. 1.—The Proprietors regret the delay in the first issue of this new annual publication, owing to the difficulty of obtaining the delivery of articles commissioned, and also to the necessity of very careful research and verification in the preparation of such a work. In the division on Roads contributions and particulars have been received from over 300 engineers, and the many valuable tables and statistics in connection with this subject occupy from thirty to forty pages alone. The Proprietors hope to announce shortly the date of publication, for the delay of which they feel assured that the increased value and authoritativeness of the volume will be ample compensation.

THE LATE THOMAS BLASHILL.

THOSE who enjoyed the friendship of the late Mr. Thomas Blashill—and they are many in all classes of life—have very real cause to mourn his sudden death on Friday morning, January 20th, for he was seen out of doors on the previous Tuesday. The funeral service took place at St. Pancras Church, Euston Road (of which he was one of the wardens), and he was laid to rest at Highgate on Tuesday, January 24th, in the presence of a large number of his old and faithful colleagues. Among many others observable at church or cemetery may be mentioned Messrs. J. W. Penfold, S. Flint Clarkson, Rowland Plumbe, A. O. Collard, John Slater, E. W. Riley, Andrew Young, John Briggs, Dr. Longstaff, Ernest Hutton, E. Guy Dawber, Louis Ambler, D. G. Driver, Max Clarke, E. O. Sachs and Hugh Stannus.

Mr. Blashill was a man of more than usual strong vitality, to which his robust Yorkshire constitution and early life spent in the country no doubt contributed. His activities found scope in many diverse quarters, and wherever he applied his abilities his friends were impressed with the kindness of heart, candour of opinion and the common-sense nature of his views and advice on all subjects. He was particularly helpful and accessible to younger men, who were constantly seeking his kindly assistance in various ways. As an architect he did a considerable amount of good work in London and the provinces, and as a younger man he was an excellent draughtsman and watercolourist. He was born at Sutton-in-Holderness seventy-four years ago, and was apprenticed to an uncle in Herefordshire. He came on a visit to London in 1854, and within three days of his arrival he was introduced to Mr. J. W. Penfold, who advised him to remain here for a time and found him an engagement in the office of Mr. T. E. Knightley. Colonel Haywood, engineer to the City Commissioners of Sewers, was an early friend, and it was through him that Mr. Blashill became responsible for the designs of new buildings erected in connection with the Holborn Viaduct Improvement. He joined Mr. Ainslie in practice in Old Jewry Chambers, and was afterwards in partnership with Colonel Haywood's brother Henry. In 1862-63 he became president of the Architectural Association, an Associate of the R.I.B.A. in 1866, a Fellow in 1877, and he was on the Council for several years. He was at one time district surveyor of Bethnal Green East and South Bow, and afterwards of West Hampstead; he was a Fellow of the Surveyors' Institution and of the Zoological Society; a member of the British Archæological Association, of the Woolhope Naturalists Field Club, Master of the Framework Knitters Company, examiner for the Borough of Battersea Technical Institute, a member of the St. Pancras Borough Council, and at various times filled other important and useful positions. He was, too, a popular member of the Honourable Artillery Company and of the Fitzroy Lodge of Freemasons.

In 1887 he was appointed superintending architect to the Metropolitan Board of Works, his private practice being taken over by Mr. A. O. Collard, one of his old pupils. His services were retained by the London County Council when the change in municipal government took place, and on his retirement from public office everyone in any way connected with building in London lost a sympathetic friend. In that official position his services and loyalty were fully recognized by the chairmen of the Building Act Committee—Mr. William Shepherd, Sir John Hutton, Dr. Longstaff, the Hon. Alan de Tatton Egerton and Mr. William Davies.

To those who were intimate with him Thomas Blashill was a constant friend, and in social and professional circles his loss has been severely felt.

Builders' Notes.

Dissolution of Partnership.—Messrs. G. M. Kerry & Co., builders and contractors, of Nottingham, have dissolved partnership.

The Glass Trade in 1904 was only moderately good as compared with previous years, but it seems to have opened rather better this year, and the trade is hoping for a greater improvement and development.

Mr. William Watt, of Messrs. George Fordyce & Co., builders, Aberdeen, has been presented with a gold watch and other gifts by his friends in the building trade, and others, on the occasion of his retirement from business.

Infringing the By-laws.—Frederick Elliott was fined £1 and 10s. costs at the Handsworth Police Court last week for erecting a house with wood hearths instead of concrete, without having a window in the drawing-room letting on to the street or other open space, and for failing to comply with the by-laws in other particulars.

Leeds Corporation and the Colsterdale Reservoir.—The Waterworks Committee of the Leeds Corporation have decided in favour of the Colsterdale reservoir in the Ure Valley being constructed by outside contract. In September last contractors were invited to send in tenders, and there was a disposition to recommend the City Council to accept the tender of a private firm, amounting to about £300,000. Labour representatives in the city, however, raised the question of the unemployed. A petition was presented, and a report from Mr. Charles Hawkesley (of the firm of Messrs. T. Hawkesley & Sons), in view of which, and other matters, it was resolved to ask some of the contractors to revise their tenders. A further resolution was passed to advertise for a waterworks engineer. The estimated cost of the Ure Valley water scheme, from start to finish, will be £2,200,000, including pipe-laying. The plans show four reservoirs, namely, Colsterdale, Leighton, Carlesmoor and Laverton, with a capacity of 4,543 million gallons and a daily yield of 15½ million gallons. The sites of the Colsterdale and Leighton dams are in the Burn Valley, while the Carlesmoor and Laverton reservoirs will be built in the Valley of the Laver. The Colsterdale reservoir is the largest of the series. It will cover 170 acres and will have a capacity of 1,852 million gallons.

Harrow Hill saved from the Builder.—Nearly 250 acres of land on the east side of Harrow Hill are to be purchased for the school at a cost of £75,000. It will be necessary, however, to leave a large amount of the purchase money on mortgage.

Edinburgh and Leith Districts Building Employers' and Allied Trades' Association.—At the thirty-third annual general meeting, held last week, the chairman (Councillor Macleod) commented on the dull state of trade during the past year and the very large number of men unemployed. For the ensuing year Mr. James Forrest was elected chairman.

First Garden City and the Unemployed.—The £2,000 required to permit the employment of 200 men at the First Garden City, near Hitchin, for three months has been more than subscribed, and the construction of dormitories, &c., for the accommodation of 300 men from the beginning of February to the end of April has been authorized.

Northamptonshire Brick Trade Depressed.—The brickmaking trade in Northamptonshire is in a very depressed condition, and while all the works at Fletton (near Peterborough) have considerably reduced their output, it is probable some will close down altogether. The price of bricks has fallen from 30s. per 1,000 to 12s. For the time being the trade is utterly paralysed, and one firm alone has 7,000,000 bricks stacked.

Messrs. Patman & Fotheringham, Ltd. (Mr. James F. Parker, managing director), builders and contractors, of 100 and 102, Theobald's Road, London, W.C., and Park Street, Islington, N., &c., have just secured a large contract for the Gunnery College additions and alterations on Whale Island, Portsmouth, for the Admiralty. These works have to be carried out in a very short time. Messrs. Patman & Fotheringham recently completed the London Coliseum.

British Standard Tables for Pipe Flanges have just been issued by the Engineering Standards Committee (28, Victoria Street, S.W.), price 2s. 6d. nett. The Committee recommend that there be four standards, namely, low-pressure standard (for steam pressures up to 55 lbs. and water pressures up to 200 lbs. per sq. in.); intermediate pressure-standard (for steam pressures between 55 lbs. and 125 lbs.); high-pressure standard (for steam pressures between 125 lbs. and 225 lbs.); and extra high-pressure standard (for steam pressures between 225 lbs. and 325 lbs.).

MR. REGINALD BLOMFIELD, A.R.A.

MR. REGINALD BLOMFIELD, who was elected an A.R.A. last week, is the grandson of the well-known Dr. Blomfield, Bishop of London, and nephew of the late Sir Arthur Blomfield, A.R.A., architect to the Bank of England. He was educated at Haileybury and Oxford, and at the architectural school of the Royal Academy, where he gained several prizes. He has chiefly devoted himself to domestic architecture, and has designed a large number of country houses during the past twenty years, including Brocklesby Park, Caythorpe Court, Meltham Hall, Heathfield Park and Holbrook House. He is an authority on Renaissance architecture, and has written a history of its development in England, published three o four years ago. Mr. Blomfield has also written on "The Formal Garden in England," and has designed and arranged gardens for the Earl of Yarborough and other landowners. A few years ago he designed a processiona cross for St. Paul's Cathedral, and his also was the design of the South African Wa Memorial erected at Haileybury College. He is the architect to the Army and Navy Society.

Enquiries Answered.

he services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

uestions should in all cases be addressed to the Editor and be written on one side of the paper only.

orrespondents are particularly requested to be as brief as possible.

he querist's name and address must always be given, not necessarily for publication.

Examinations.

G. H. writes: "I wish to enter for some aminations that would be beneficial to me after-life. I have served 5½ years in rious offices, four years in an architect d surveyor's office, then occupying a sition as surveyor, &c., on an estate. What you advise?"

We think the best examinations you could in for, considering the fact that you have d experience as a surveyor, would be those the Surveyors' Institution. The address of e secretary is—George Street, Westminster.

Decorative Plasterwork.

AYR.—AILSA writes: "Is there any way of eparing plaster either on a strapped wall on a rendered wall so that a decorative nel may be painted in oil direct on the aster, which would be rough (left off the at) to give texture, and so that the painting ay be done, say, a week or two after the aster is pronounced to be dry? Also, is ere any way of colouring plaster by mixing louring matter with it so as to form a ckground for a sort of cartoon effect? In is way the texture would be retained, and would be more effective than applying a background coat of paint."

(1) The plaster should be dry before paint is put on. This might be done quickly by drying out with coke fires. The usual method where work is required to be painted quickly is to use fibrous plaster, which, being in thin sheets, can be dried out in front of coke fires. (2) Powdered colouring matters can be mixed with the plaster to gain any tint.

"Yotto" Gas Burners.

LEYTONSTONE.—A WEEKLY SUBSCRIBER writes: "Who is the London manufacturer or agent for 'Yotto' chimneyless incandescent burners?"

Messrs. Young & Marten, Ltd., of Caledonian Works, Stratford, E., are the London agents.

Buildings to Measure around Barnet.

NEW BARNET.—W. writes: "Please name some buildings near Barnet that would be suitable to measure for the R.I.B.A. final examination."

If permission could be obtained from Lord Salisbury to do so, nothing could be better than to measure part of Hatfield House, which is within easy reach of Barnet by rail. Failing this, Waltham Cross or part (say a bay of the nave arcade) of Waltham Abbey would be suitable, being within a bicycle ride; as also is St. Albans Abbey, though it has been so completely altered in restoration that there is little left worth studying. G. A. T. M.

Strength of Brackets on Cast-iron Columns.

CLEVEDON.—H. T. writes: "What load may safely be put on the cast-iron brackets marked X on the accompanying sketch?"

The pockets or brackets shown by Fig. 1 and Fig. 2 are, in themselves, amply strong enough for any load that can be put upon them by the timbers, but their connection with the column is weak and fracture might occur through A A (Fig. 4). If the 12×4 timber fits closely, and 1¼in. bolts are put through the cheeks on each side of the cross timbers, as shown in Fig. 1 and Fig. 2, they will no doubt be secure; but if an alteration can be made in the design, as in Fig. 3, the column will be safer. It will be seen that internal curves are put in the bottom of the box, the neckings placed lower and the brackets made longer. The calculation of strength of the original design without the bolts would be as follows:—The section of possible fracture would be as Fig. 4 and Fig. 5, but the tension part, 16ins. by 1¼ins., would be inherently weak from the square angle inside the box causing a defective arrangement of the crystals in the cooling of the casting, and the maximum safe load could not be considered more than ½ ton = 1,120 lbs. to the square inch. The centre of gravity of fracture surface would be

$$\frac{16 \times 1{\cdot}25 \times {\cdot}625 + 2{\cdot}375 \times {\cdot}75(1{\cdot}1875 + 1{\cdot}25)}{16 \times 1{\cdot}25 + 2{\cdot}375 \times {\cdot}75} = \frac{12{\cdot}5 + 4{\cdot}113}{20 + 1{\cdot}78} = \frac{16{\cdot}613}{21{\cdot}78} = {\cdot}763 \text{ ins.}$$

The moment of inertia of the section would be

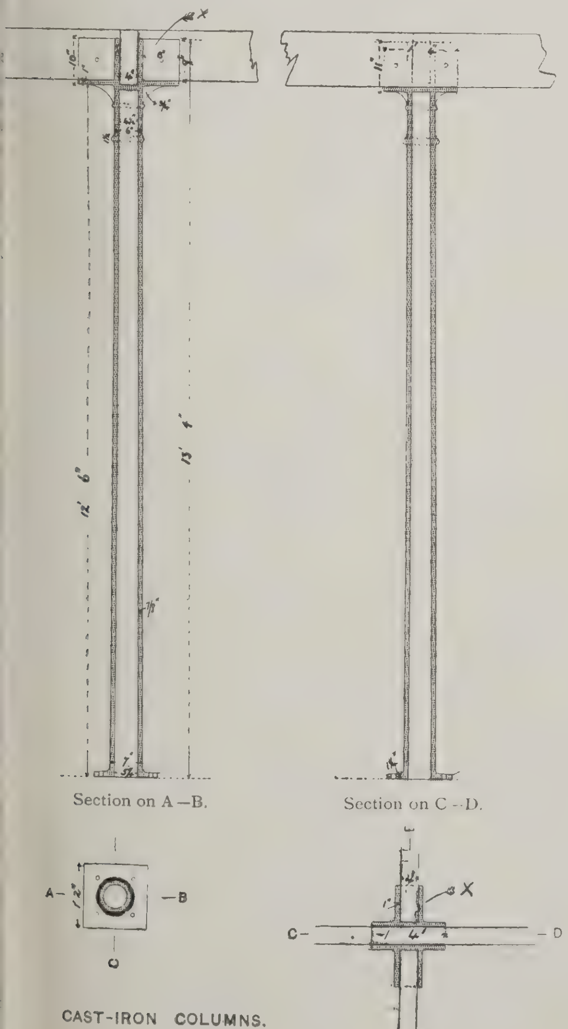
$$\frac{{\cdot}75(1{\cdot}25 + 2{\cdot}375)^3 + (16 - {\cdot}75)125^3}{12} = \frac{35{\cdot}73 + 29{\cdot}78}{12} = 5{\cdot}46 \text{ in. units,}$$

and the modulus of section would be

$$\frac{5{\cdot}46}{2{\cdot}375 + 1{\cdot}25 - {\cdot}763} = \frac{5{\cdot}46}{2{\cdot}862} = 1{\cdot}908 \text{ in. units.}$$

Then the moment of resistance $zc = 1{\cdot}908 \times 1120 = 2{,}137$ lb.-ins., and the bending moment will be $w\,(4{\cdot}3) = 4{\cdot}3\,w$. Then as the bending moment must equal the moment of resistance, $4{\cdot}3\,w = 2137$, whence $w = \frac{2137}{4{\cdot}3}$ = say 500 lbs. This of course is only approximate, as the mode in which the cross-beams bear in the sockets will greatly influence the result. It is assumed in the calculation that they rest equally over the whole bearing surface.

HENRY ADAMS.



Section on A—B.

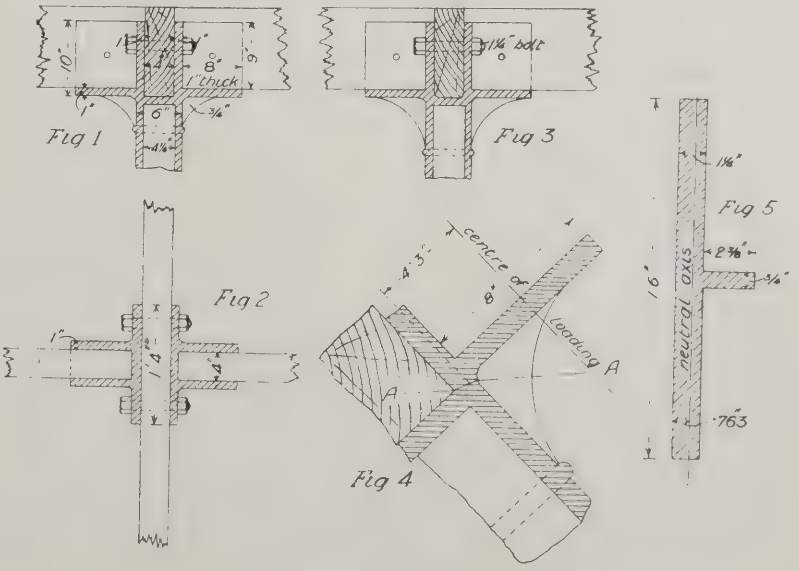
Section on C—D.

CAST-IRON COLUMNS.

"Tarmac."

OGMORE VALE.—W. T. J. writes: "On p. 301 of your issue for December 7th last a report was given of a paper read before the Automobile Club by Mr. Scott Montagu, M.P., on dustless roads. 'Tarmac' was mentioned as being the most successful metalling for such roads. Where and by whom is 'Tarmac' prepared? Does it make a good permanent road as well as being dustless? Can you give me particulars of the kiln for heating the slag, and to what temperature it is necessary to heat it? Could you also give me the address of the Welsh Macadam Co., Ltd., mentioned under 'New Companies' in your issue for January 4th?"

"Tarmac" is a proprietary article prepared by The Tar Macadam (Purnell Hooley's Patent) Syndicate, Ltd. The patentee is the county surveyor of Nottinghamshire, an acknowledged authority on the subject of macadam roads. We are unable to give particulars of the kiln employed, this being a patent of Mr. Hooley's. The success of "Tarmac" is due to the care and knowledge exercised in its manufacture; the quality, quantity and mixing of the ingredients being essential points. Tar macadam can be prepared by anyone; but in many cases roads made with this material have failed



BRACKETS FOR CAST-IRON COLUMNS.

owing to there being an excess of tar or to the stone employed not being sufficiently absorbent to retain the tar or not being sufficiently heated. When properly compounded it makes excellent roads, with a saving in maintenance, scavenging and watering. It is excellent for motor and cycle traffic. The absence of dust is not its only recommendation, as tar is an excellent binding, and by preventing the rapid attrition of the stone and its consequent "breaking down" makes the road more durable. The material is also more impervious, and consequently more sanitary, than ordinary macadam. The usual stoves for heating the stone are simple floors of either iron or brick with flues under. Iron floor stoves can be obtained from one or two ironfounders; the brick floor may be constructed like the floor of a brick kiln. The tar is heated in an ordinary tar boiler. We add particulars of the method of making tar macadam roads at Harrogate, which town is noted for this kind of road. Foundation:—9in. stone pitching with 4ins. of ballast, cost 1s. 8d. sq. yd.; tar macadam of limestone; bottom coat, gauge 2¼ ins.; middle layer, gauge ¾in.; top or surface layer, gauge ⅜in. mixed with 12 per cent. of coke-breeze. The tar is used plain and cold. The stone is heated on an iron floor stove made by a Batley firm; when hot (so that the hand can barely rest on it) the tar is poured over it, and the whole is turned over so that the stone is completely covered. The average quantity of tar is 6 or 7 gallons per cub. yd., but the amount varies according to the size and porosity of the stone and the quality of the tar. (Poor tar is sometimes heated, a little creosote and pitch being added to enrich it.) After manufacture the material is stored three months to mature. The bottom layer is 2¼ins. thick after rolling, the middle layer ½in. thick after rolling, and the top or surface coat ¼in. after rolling. Each coat is rolled with a 10-ton roller, the rollers being wetted to prevent the material adhering. Traffic admitted after one week. Cost of tar macadam, 2s. to 2s. 3d. sq. yd. Total cost of road, 3s. 8d. to 3s. 11d. sq. yd. Particulars of tar macadam roads and footpaths in many towns will appear in the first (annual) issue of "The Municipal Engineer's Specification," to be published shortly from these offices, price 2s. 6d. We regret we do not know the address of the Welsh Macadam Co., Ltd., but you could obtain it from Messrs. Jordan & Sons, Ltd., 120, Chancery Lane, W.C., by whom the company was registered.

Roof-Trusses.

HESSLE.—FERRUM writes: "It is required as one of the testimonies of study for the R.I.B.A. final examination to draw 'diagrams of roof-truss of iron or steel not less than 40ft. span, with details to a large scale, with all the calculations for strength at the various parts fully worked out and appended thereto.' Can you refer me to the best and simplest authority for working out the strength of joints? I presume the section of the main members may be determined by graphic statics."

"Practical Designing of Structural Ironwork," by Prof. Henry Adams (price 8s. 6d. post free from our offices).

House Design.

BATH.—A. H. H. writes: "With the help of a builder I am preparing the designs of an house to cost about £700. Where could I obtain a few designs of modern houses of moderate size (detached) that would be of service to me in fixing the design of my own?"

We have published a number of illustrations of houses of this class in the last few years. If you desire to obtain complete working drawings you will not find what you want published in England—in the United States a good many books of designs are published. We cannot commend this. A design should be made to fit the local conditions and desires of the owner, and we advise you to apply to a competent architect.

Porosity of Marble.

DEVON.—ENQUIRER writes: "If I put a thin piece of marble in a cup filled with water, so that the water was touching the lower side, would the water cause the marble to be constantly damp on its upper surface, or could you inform me what material there is that would absorb water in this way?"

The marble would be damp, as it is somewhat porous; but there are other more porous materials which might serve your purpose better, such as pumice-stone, coke-breeze concrete and brick.

Hospital Planning.

GLASGOW.—A. W. writes: "Kindly name any recent and good work dealing with the planning (and more especially the engineering work) of hospitals."

We do not know of any very recent book. Probably the best for your purpose would be Sir Henry Burdett's "Cottage Hospitals" (10s. 6d. post free from our offices).

White Rough-cast.

WORKINGTON.—H. H. writes: "(1) How can I get a distinctly white colour on rough-cast? I do not mean the bluey-grey tint of lime rough-cast. (2) I note that in 'Specification' there is specified:—Portland cement, sand, pea-grit, &c., and 1 part of ground chalk. Will this produce the result I desire?"

(1) See a reply to an enquiry on this subject on p. 440 of our issue for January 9th, 1901. (2) Yes; the suggested method, if the sand is white and the cement not too grey, will give a good white colour.

Drawings and Models.

EDINBURGH.—GLENEVAN writes: "I contemplate building a small country house, and before engaging the services of an architect I am making a plan of the house myself in a rough way, and would like to hear of someone who could give me a finished plan, also a sketch. I should also like to know of someone who could make a small model of the house."

We advise you to consult an architect, otherwise you will probably neither secure efficiency nor economy. Very good models are made from plans and elevations by the London Drawing and Tracing Office, 98, Gray's Inn Road, London, W.C.

Payment for Additional Brickwork.

BERMONDSEY.—T. writes: "On p. 20 of your issue for January 11th you answered a question in which the word 'similar' was in the contract. Surely 14in. work is not similar to 9in. You say that I was supposed to have known what I was doing. I was taking it as 9in. brickwork, that is, similar to the other two fronts which were of 9in. work, and the surveyor knew it."

You do not state if there were any plans. If there were, and you were supposed to have seen them before you sent in your estimate, and 14in. brickwork was shown thereon, extra payment is not due, because then the word "similar" could only be read to apply to the colour and kind of bricks and general execution, and not the thickness.

Valuations and Estate Management.

GLASGOW.—SUBSCRIBER writes: "Which are the best works on (a) valuing, with special reference to Scotland, and (b) property and estate factoring?"

(a) "Valuations and Compensations," by Prof. B. Fletcher (6s. 6d.); (b) "Building Estates," by F. Maitland (2s.), and "Outlines of Landed Estates Management," by R. S. Burn (2s. 6d.). These prices are post free from our offices.

Damage Done by Frost.

BERMONDSEY.—T. T. writes: "Referring to the enquiry on p. 12 of your issue for January 4th, my facts were not put rightly. They should be as follows:—The brickwork was built partly with new and partly with old bricks and mill-mortar. The joints were raked out and pointed with mortar and cement, and left sound and perfect. The scaffolding was taken down and the work was passed as satisfactory. The work was done in October, and in November the frost came and flaked off parts of the joints. In December I asked for payment. I was then told that the frost had pulled out some of the joints, and I was called upon to put up scaffolding and make good before payment. Am I to be paid for this extra work? Am I to leave the scaffold there till next June? Can they compel me to do the work twice and get paid once? Has there ever been a question of this description decided in a court of law?"

We are still of the opinion that the work of re-pointing was not executed properly, and that your clients can deduct from your account a sum sufficient to get the pointing made good, if you will not make it good yourself. We do not remember an exactly similar case being decided at law, but if your client can bring expert evidence to prove the work was improperly executed you will have no case. It is all nonsense to talk about leaving the scaffold up for months. Of course it would be absurd to expect such a thing; precautions should have been taken to guard against damage so as to avoid the necessity of re-erecting the scaffold. As to the precautions that should have been taken, the joints should have been carefully raked out and washed with a stiff brush so as to remove all dust from the old mortar in order to give a good hold for the mortar and the bricks allowed to dry before pointing cement should have been used, as this sets and gets rid of its water quickly and once set will not be damaged by frost, or else unslaked lime used and the mortar prepared in small quantities immediately before being used, as should always be done in frosty weather, the unslaked lime developing warmth. It is only a question of utilizing th mortar quickly enough to enable it to bind with the bricks before it cools. If th weather is frosty the precaution should als be taken to put sacking against the wa where wet.

Book on Stair Construction.

ABERDOVEY.—A. S. writes: "Please nam a good book on stair construction showin accurately the way to proceed in markin and setting-out a circular and continual ra stair, &c."

Mowat's "Stairbuilding and Handrailing (price 12s. 6d. post free from our offices).

Glazed Brickwork.

LEEDS.—R. F. F. writes: "Is glaze brickwork dealt with in any number 'Specification'?"

Glazed brickwork is dealt with in "Spec fication" in the "Bricklayer" section, whi glazes are dealt with in the "Terra-cot and Faïence Worker" section. The la number is out of print; but a copy "Number 6" can be had, price 5s. 9d. po free, if you require information immediatel "Number 8" will be ready shortly, an to be sure of getting it you should order copy at once.

Keystones.

A new Court House is to be built at eltham.

For improving the Streets of Athens everal schemes are now under consideration y the municipality.

The Carpenters' Company will entertain ie president and vice-presidents of the ociety of Antiquaries at dinner at Car- enters' Hall on Wednesday, February 22nd.

Incorporated Clerks of Works Association Great Britain.—The twenty-second annual inner will be held at the Criterion Restau- nt on Saturday, February 11th, at 6.15 p.m.

For converting the Old School Buildings Norwood into a home for aged married ouples and aged women, the design of r. E. C. Beaumont, of London, has been lected in competition. The estimated ost is £3,950.

"To Associate Technical Instructors."— he annual general meeting of the Associa- on of the Teachers in Technical Institutes onstituted in October last) was held at the irkbeck College, London, on January 21st, hen the constitution and rules were oproved and officers elected.

The Town Walls of Newcastle.—At last Vednesday's annual meeting of the New- stle Society of Antiquaries a long discussion ok place on the proposed demolition of e Plummer Tower and the preservation of e town walls. The council of the Society as instructed to take immediate steps for eservation and custody.

At the Leys School a swimming-bath, a iapel and a new gymnasium are to be pro- ded. The swimming-bath is now being iilt at a cost of £6,000 to the designs of r. Robert Curwen, architect of the school. iriously enough, there is at present no vimming-bath in the university town of ambridge. The Leys swimming-bath will 90ft. by 35ft.

Royal Naval College, Dartmouth.—This iportant building, designed by Sir Aston ebb, R.A., F.R.I.B.A., has now been com- eted. It provides accommodation for 396 dets, who will be drafted from Osborne ollege to pass the second two years of the ur which cover their early training as ficers. A full description of the building as given on p. 80 of our issue for September 1, 1903.

Preston School Competition.—The con- tions of this competition provide that the chitect's fee shall include payment for bills quantities and other surveyor's work, tlement of accounts, and several extra pies of plans. In reply to a letter from the stitute calling the attention of the Preston ucation Committee to the inadequacy of remuneration offered, the director writes it he cannot hold out any hope that his mmittee "will modify the remuneration ered to architects, or its terms." Architects therefore requested not to compete.

The New Victoria Station Front.—Writing the "Times" in regard to the protest of the chitectural Vigilance Society against the posed new front to Victoria Station (see 34 of our issue for January 18th), Mr. islie J. Horniman states that under the ndon, Brighton and South Coast Railway t of 1899 the elevation of any building itting on Buckingham Palace Road had to approved by the Grosvenor Estate, the City uncil of Westminster and the London unty Council. "It was wholly due to the ion of the last-named body, at the insti- tion of its architect, that we now have a ll which your correspondents truly say, iough simple, is in good architectural te.'" Mr. W. E. Riley (superintending hitect to the London County Council) pared the sketch design.

For Cleaning the "Underground" Tunnels and brightening-up the stations £10,000 is to be spent.

Elgin Parish Church Competition.—The design of Mr. P. Macgregor Chalmers, of Glasgow, has been selected by the congregation.

Carnegie Library, Wardle, Rochdale.—The limited competition for this building has been decided in favour of Messrs. Butterworth & Duncan, of Rochdale.

Change of Address.—Messrs. Treadwell & Martin, architects and surveyors, have moved their offices from 2, Waterloo Place, Pall Mall, to Charing Cross House, 29A, Charing Cross Road, W.C. Their telephone number, however (5337 Gerrard), remains unchanged.

A Figure of an Angel has been approved by the Kaiser for erection in the Hall of Fame in the graveyard at Gravelotte. The figure is of gilded bronze 10ft. high, and stands on a pedestal of polished black granite. Its eyes are of precious stones, and the hem of its garment is studded with green agates.

Seventh International Congress of Architects, 1906.—The council of the Institute has voted a sum of £500 for the purposes of this congress, which is to be held in London from July 16th to 21st next year. The patronage of the King, the Prince of Wales, the Duke of Connaught and other distinguished persons has been secured.

A new Public Health Laboratory at Manchester has been erected in York Place, Oxford Road, at a cost of £13,000. It has grown out of the bacteriological department of the Owens College (now the University of Manchester) and was planned by Professor Delépine. Messrs. William Southern & Sons, of Manchester, were the builders.

A new Church at Kirkby Woodhouse is being erected from designs by Mr. Louis Ambler, F.R.I.B.A., of London. The foundation stone was laid by the Duke of Portland last week. The first portion of the work, comprising nave (77ft. by 24ft.) and chancel (33ft. by 20ft.), will cost about £6,000. Accommodation will be provided for about 400 worshippers. A tower and spire will be built later. Mr. William Smith, of Newark, is the builder and Mr. D. Davies the clerk of works.

Leeds and Yorkshire Architectural Society.—At last Thursday's meeting Mr. Thomas H. Mawson, hon. A.R.I.B.A., read a paper on "The Principles and Practice of Garden Making." After having enunciated guiding principles he emphasized the importance of the proper laying-out of trees and plantations. The three great considerations in deciding upon the site and position of a house were—climatic conditions, nature of subsoil, and the aspect (for no matter what the prospect offered it was unwise to build on the north, north-west or north-east side of a hill or knoll). Beds of clay, though perhaps not so unhealthy, were cold and disagreeable, and difficult to drain by the natural process of filtration. For healthy beauty, luxuriance and ultimate cheapness Mr. Mawson advised a site having an under-stratum of gravel or marl and a good surface covering of loam. With regard to surface-soil for a flower bed, it was a good plan to lay at a depth of about 2ft. a layer of broken bricks, then to overlay this with a covering of ashes, and then about 21ins. of soil of desirable lightness: for trees and shrubs a depth of 1ft. 6ins. or 2ft., with a plentiful admixture of fibrous turf loam, was satisfactory. Grass also required a depth of soil not less than 8ins., with a well-drained bottom properly prepared. Mr. Mawson showed three garden schemes designed by him, one in Ashdown Forest, another on Berkhamsted Common and the third in Devonshire.

Glasgow Technical College Architectural Craftsmen's Society.—At last Friday's meeting of this society Mr. Smith, inspector of works at the new college buildings, read a paper on mechanical ventilation, in which he claimed that the plenum system was the best adapted for the ventilation of large buildings in towns, by reason of the ease with which it could be controlled. In the discussion which followed the advantages of "automatic ventilation" and of the "equilibrium" system of mechanical ventilation were upheld by several members.

New Mission Premises in St. Peter's Parish, Islington, were opened on Wednesday last by the Bishop of Islington. On the ground floor is a hall to seat about 150 people. The first floor is divided into class-rooms and club-room, and the second floor provides accommodation for caretaker and parish workers. The building is warmed by means of hot-water radiators from a boiler in the basement. The total cost has been £2,800. The architects were Messrs. James & Laycock, of 4, Bloomsbury Place, W.C., and the builders Messrs. Patman & Fotheringham.

An Alarming Incident occurred recently at Trinity Street Station, Bolton. Whilst business was proceeding as usual a crack like that of a rifle startled everybody in the booking-hall. The noise was immediately succeeded by a shower of ice, and then it was perceived that the cause was the bursting of one of the three iron pillars which support the roof. It was undoubtedly due to the freezing of a quantity of water which had got into the hollow centre of the column when the booking-hall was being erected. It is presumed that the column was half or three-quarters full. It is worth noting that the column was situated in a very draughty position, the cold air coming up the staircase from the up platform and passing through the booking-hall into Trinity Street.

Views and Reviews.

A Welsh Cathedral.

Sir Gilbert Scott is anathema to the anti-restorationists, but we must even give the Devil his due and this cathedral of St. Asaph is an instance of Scott's good-doing, for it was under his direction the layers of whitewash that covered the interior were removed, as well as the stucco of Wyatt, who also constructed a false roof to the nave which entirely concealed the clearstory from within. The whole history of the cathedral is very readably brought together here, supplemented, as in the other books of this series, with numerous photographs and reproductions of old engravings: the former, by the way, are excellent, but the author might have found a more proficient friend to photograph the engravings, which are sadly out of focus and blurred in places.

"The Cathedral Church of St. Asaph," by Pearce B. Ironside Bax. London: George Bell & Sons, price 1s. 6d.

Laxton's Price-Book.

This is the eighty-eighth edition of "Laxton's." As heretofore, it has been revised and brought up to date. There are no radical alterations—nor could there be in such a book—but builders and architects will of course need to have this latest edition. As pointed out quite recently in our columns, it is essential for go-ahead business men to use reference books absolutely current: books a year or two old will not do. Hence readers should throw away their old editions of "Laxton's" and get this one.

"Laxton's Price-book for Architects, Builders, Engineers and Contractors, 1905." London: Kelly's Directories, Ltd., 182-184, High Holborn, W.C., price 4s.

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Feb. 2	Leftwich, Northwich—Hospital	Hospital Committee	J. Crawley, Bull Ring, Northwich.
,, 2	London, N.W.—Buildings, &c.	Hampstead Borough Council	O. E. Winter, Town Hall, Hampstead.
,, 2	Bangor—Alterations to House	Guardians	R. Davies, Architect, Bangor.
,, 2	Hampstead—Building, &c.	Borough Council	O. E. Winter, Town Hall, Hampstead.
,, 3	Bath—Showyard	Agricultural Association	A. B. Cottam, Bridgwater.
,, 4	Aberystwyth—Tower, &c., to Church	——	Nicholson & Hartree, Architects, Hereford.
,, 4	Carlisle—Alterations, &c., to Property	Corporation	H. C. Marks, 36 Fisher Street, Carlisle.
,, 6	Leeds—Repairs to Schools	Education Committee	Architects' Department, Education Offices, Leeds.
,, 7	Pontypool—Rebuilding of Inn	——	D. J. Lougher, Bank Chambers, Pontypool.
,, 7	Farnham—Grammar School	Governors	Jarvis & Richards, 36 Victoria Street, S.W.
,, 7	Carmarthen—Engine-shed	Directors of G.W. Railway	Engineer's Office, Neath Station.
,, 7	Leeds—Sorting Office	Commissioners	Secretary, H.M. Office of Works, Storey's Gate, S.W.
,, 7	Bargoed, Wales—Thirty-five Houses	Building Club	E. G. Henton, 22 Cardiff Street, Aberdare.
,, 8	Glasgow—Baths, &c.	Corporation	A. B. M'Donald, 64 Cochrane Street, Glasgow.
,, 8	Stoke-on-Trent—Additions at Workhouse	Guardians	A. P. Miller, Architect, Frederick Street, Hanley.
,, 8	Wembley—Four Cottages	Urban District Council	C. R. W. Chapman, Public Offices, Wembley.
,, 8	Hull—Warehouse, Offices, &c.	N.E. Railway Co.	William Bell, Company's Architect, York.
,, 9	Twickenham—Cottages, &c.	Council	F. W. Pearce, Town Hall, Twickenham.
,, 9	Goring-on-Thames—Gasworks Extensions	Thames Valley and Water and Gas Co.	Thames Valley and Goring Water and Gas Co., 20 Bucklersbury, E.C.
,, 9	Kirton, Lincs—Laboratory	——	J. Rowell, Church Lane, Boston.
,, 10	Southend—Extensions of Boiler-house	Corporation	E. J. Elford, Borough Engineer, Southend.
,, 11	Woking—Retort-house	District Gas Co.	W. A. Valon & Son, 140 Temple Chambers, E.C.
,, 11	Shepton Mallett—School	Education Committee	County Education Secretary, Weston-super-Mare.
,, 11	Galleywood, Essex—Foundations, &c., for Hospital	Hospital Board	A. S. Duffield, 96 High Street, Chelmsford.
,, 11	Hessenford, St. Germans—Schoolroom, &c.	——	W. Matthews, Hessenford.
,, 11	Narberth—Excise Warehouse	Mr. J. Williams	J. Williams, Narberth.
,, 13	Mountain Ash, Wales—School, &c.	Urban District Council	W. G. Thomas, Public Offices, Mountain Ash.
,, 13	Portsmouth—School	Education Committee	G. C. V. Inkpen, 40 Commercial Road, Portsmouth.
,, 14	South Kensington Generating Station	Commissioners	Secretary, H.M. Office of Works, Storey's Gate, S.W.
,, 16	Beaminster—School	Governors	R. Leigh, Beaminster.
,, 17	Atcham—Additional Storey to Bathroom	Guardians	Union Offices, St. John's Hill, Shrewsbury.
,, 17	Oulton, near Lowestoft—Enlargement of Buildings	County Education Committee	F. W. Richards, 14 Stanley Street, Lowestoft.
,, 22	Dartford—Buildings to Hospital	Metropolitan Asylums Board	Office of Board, Embankment.
,, 23	Belgrave, Leicester—House, &c.	Sewage Works and Farms Committee.	E. G. Mawbey, Town Hall, Leicester.
,, 28	Preston—School	Corporation	Director of Education, Education Offices, Preston.
March 4	Nelson—Free Library	Corporation	J. H. Baldwick, Town Hall, Nelson.
,, 31	Taunton—School	Education Committee	G. H. Kite, Municipal Buildings, Taunton.
No date	Sutton-in-Ashfield—Alterations, &c., to Town Hall	——	J. P. Adlington, High Pavement, Sutton-in-Ashfield.
,,	Thrybergh, Yorks—Alterations at School	Education Committee	J. Vickers-Edwards, County Hall, Wakefield.
	ENGINEERING:		
Feb. 2	Handsworth, Birmingham—Power and Lighting Circuits	Urban District Council	H. Ward, Council House, Handsworth.
,, 2	Salford—Re-construction of Bridges	Building and Bridges Committee	C. S. Allott & Son, 46 Brown Street, Manchester.
,, 4	Kirkcaldy—Extension of Pier	Town Council	W. M. Macindoe, Town Clerk, Kirkcaldy.
,, 4	Harrogate—Borehole	Corporation	E. W. Dixon, 14 Albert Street, Harrogate.
,, 6	Stockport—Overhead Equipment	Tramways Committee	A. J. H. Carter, Borough Electrical Engineer, Millgate, Stockport.
,, 6	Glasgow—Pressing Plant	Corporation	T. Meluin, 30 Cochrane Street, Glasgow.
,, 6	Ebbw Vale, Wales—Reservoir, &c.	Urban District Council	T. Hughes, Clerk, Ebbw Vale.
,, 7	Widnes—Boring	Corporation	I. Carr, Widnes.
,, 7	Shrewsbury—Concrete Foundations, &c., to Water Tank	Lighting Committee	Borough Electrical Engineer, Borough Electricity Works, Roushill.
,, 8	Arbroath, N.B.—Supplying and Laying Water Pipes	Corporation	Crouch & Hogg, 53 Bothwell Steel, Glasgow.
,, 8	Rishton, Lancs—Calvert	Urban District Council	Surveyor, 4 Church Street, Rishton.
,, 9	Twickenham—Pumping Station	Urban District Council	F. W. Pearce, Town Hall, Twickenham.
,, 11	Woking—Gasholder, &c.	District Gas Co.	W. A. Valon & Son, 140 Temple Chambers, E.C.
,, 13	Todmorden—Purifiers	Gas Committee	Gasworks, Millwood, Todmorden.
,, 13	Nottingham—Reservoir	Water Committee	F. W. Davies, Water Office, Peter's Square, Nottingham.
,, 15	North Sunderland—Reservoir	Trustees	Office of Trustees of Lord Crewe's Charity, 61 Westgate Rd., Newcastle.
,, 17	Cape Clear, co. Cork—Breakwater, &c.	——	Assistant Surveyor of Buildings, 1 River View, Summer Hill, Cork.
,, 18	Bury, Lancs—Waterworks, &c.	Water Board	J. Cartwright, Peel Chambers, Bury.
March 31	Shanghai—Electric Tramways	Municipal Council	J. Poor & Co., 63 Leadenhall Street, E.C.
	IRON AND STEEL:		
Feb. 3	Sheffield—Pipes	United Gaslight Co.	H. Thomas, General Manager, Commercial Street, Sheffield.
,, 4	Ilfracombe—Water Mains	Urban District Council	O. M. Prouse, Town Hall, Ilfracombe.
,, 4	Larne, Ireland—Shovels, Spades, &c.	Urban District Council	Surveyor's Office, Larne, Ireland.
,, 6	London, E.C.—Sewer Ironwork	Finsbury Borough Council	Borough Surveyor's Department, Town Hall, Rosebery Avenue, E.C.
,, 6	London, S.E.—Ironmongery	Bermondsey Borough Council	Council Offices, Town Hall, Spa Road, S.E.
,, 6	London, S.E.—Ironwork for Sewers	Lewisham Borough Council	Surveyor's Department, Town Hall, Catford.
,, 8	Watford—Iron Double-hung Sashes to Windows	Metropolitan Asylums Board	Office of Board, Embankment, E.C.
,, 9	London, W.—Ironmongery	Chiswick U.D.C.	J. Barclay, Town Hall, Chiswick.
,, 9	West Ham—Ironmongery	Town Council	Borough Engineer's Office, Town Hall, Stratford, E.
,, 15	Hampstead—Ironmongery, &c.	Council	Borough Engineer, Town Hall, Haverstock Hill, N.W.
,, 20	London, N.—Ironmongery, &c.	Hornsey Town Council	R. J. Lovegrove, 99 Southwood Lane, Highgate.
,, 27	Urmston, Lancs—Gates and Railings	Urban District Council	Council's Surveyor, Urmston, Lancs.
March 7	Brisbane, Australia—Rails, &c.	——	Agent-General for Queensland, 1 Victoria Street, S.W.
	PAINTING AND PLUMBING:		
Feb. 2	London, S.E.—Painting at Baths	Lambeth Borough Council	H. Edwards, 346 Kennington Road, S.E.
,, 6	Manchester, Liverpool, &c.—Painting	Lancs and Yorks Railway Co.	Engineer's Office, Hunt's Bank, Manchester.
,, 6	London, N.W.—Paints	St. Pancras Borough Council	W. N. Blair, Borough Engineer, St. Pancras, N.W.
,, 6	London, S.E.—Paints, &c.	Bermondsey Borough Council	Council Offices, Town Hall, Spa Road, S.E.
,, 6	London, S.E.—Paints and Oils	Lewisham Borough Council	Surveyor's Department, Town Hall, Catford.
,, 7	Leicester—Painting Exterior of Asylum	Lunatic Asylum Visiting Committee.	E. G. Mawbey, Town Hall, Leicester.
,, 8	Painting Station Buildings	N.E. Railway Co.	Charles A. Harrison, Company's Engineer, Newcastle-on-Tyne.
,, 8	London, W.—Oilman's Goods, &c.	Hammersmith Borough Council	Town Hall, Hammersmith.
,, 9	West Ham—Oils, Colours, &c.	Town Council	Borough Engineer's Office, Town Hall, Stratford, E.
,, 9	London, W.—Oils, &c.	Chiswick U.D.C.	J. Barclay, Town Hall, Chiswick.
,, 18	Plymouth—Paint and Oil	Corporation	J. Paton, Borough Engineer, Plymouth.
	ROADS AND CARTAGE:		
Feb. 2	Haworth, Yorks—Road Works	Urban District Council	Barber, Hopkinson & Co., Craven Bank Chambers, Keighley.
,, 2	Leeds—Paving, &c.	Highways Committee	City Engineer's Office, Municipal Buildings, Leeds.
,, 2	Eastleigh, Hants—Macadam	Urban District Council	W. W. Gandy, Council Offices, Eastleigh.
,, 2	Isle of Ely—Broken Materials	County Council	H. Farr Simpson, County Surveyor, Northern Division, Wisbech. R. S. W. Perkins, County Surveyor, Southern Division, Ely.
,, 3	Brandon, Durham—Slag, &c.	Urban District Council	G. G. Donkin, Surveyor, Langley Moor.
,, 6	Cheriton, Kent—Paving, &c.	Urban District Council	Surveyor's Office, Public Offices, Cheriton.
,, 6	Dartford—Street Works	Rural District Council	W. W. Hartston, 8 Hythe Street, Datford.
,, 6	Dewsbury—Paving, &c.	Corporation	Borough Surveyor's Office, Town Hall, Dewsbury.
,, 6	London, S.E.—Kerbing	Lewisham Borough Council	Surveyor's Department, Town Hall, Catford.
,, 6	London, W.—Granite Setts	Paddington Council	E. B. B. Newton, Town Hall, Paddington.
,, 6	London, S.E.—Broken Granite, &c.	Bermondsey Borough Council	Council's Office, Town Hall, Spa Road, S.E.
,, 6	Grimsby—Granite Setts and Kerbs	Corporation	W. A. Vignoles, Corporation Electricity Works, Grimsby.
,, 7	Aylesbury—Flints	County Council	R. J. Thomas, County Hall, Aylesbury.
,, 8	London, W.—Granite, &c.	Chiswick U.D.C.	J. Barclay, Town Hall, Chiswick.
,, 8	Birkenhead—Granite, &c.	Corporation	C. Brownridge, Town Hall, Birkenhead.
,, 8	London, W.—Granite and Flints	Hammersmith Borough Council	Town Hall, Hammersmith.
,, 9	West Ham—Paving Materials, &c.	Council	Borough Electrical Engineer's Office, Town Hall, Stratford, E.
,, 9	Hull—Granite	Corporation	A. E. White, Town Hall, Hull.
,, 9	Llandudno—Road-making, &c.	Urban District Council	E. P. Stephenson, Town Hall, Llandudno.

Complete List of Contracts Open.—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	ROADS AND CARTAGE—*cont.*		
Feb. 11	Chelmsford—Granite Kerb and Setts	County Council	P. J. Sheldon, Surveyor, Chelmsford.
,, 13	Mirfield, Yorks—Street Works	Urban District Council	E. Gill, Council Offices, Fold Head, Mirfield.
,, 13	Bristol—Paving Materials	Sanitary and Improvement Committee.	T. H. Yabbicom, 63 Queen Square, Bristol.
,, 14	Long Sutton, Lincs—Granite, &c.	Urban District Council	S. S. Mossop, Clerk, Long Sutton.
,, 15	Folkestone—Granite and Chippings	Corporation	A. E. Nichols, Corporation Offices, Folkestone.
,, 15	Hampstead—Granite Paving, &c.	Council	Borough Engineer, Town Hall, Haverstock Hill, N.W.
,, 17	Urmston, Lancs—Paving, &c.	Urban District Council	J. Heath, Council Offices, Urmston.
,, 18	St. Thomas, near Exeter—Road Materials	Rural District Council	A. E. Ward, 9 Bedford Circus, Exeter.
,, 20	Hornsey—Road Materials, &c.	Town Council	E. J. Lovegrove, 99 Southwark Lane, Highgate.
,, 22	Wanstead, Essex—Making-up Streets	Urban District Council	Surveyor's Department, Council Offices, Wanstead.
,, 26	Harrogate—Street Works	Corporation	F. Bagshaw, Borough Engineer, Harrogate.
,, 28	Hatfield, Herts—Granite and Slag	County Council	U. A. Smith, County Surveyor, Hatfield.
	SANITARY:		
Feb. 2	Blaydon-on-Tyne—Scavenging	Urban District Council	R. Biggins, Council Offices, Blaydon-on-Tyne.
,, 3	Penzance—Lavatory	Public Building Co.	F. Latham, Surveyor, Public Buildings, Penzance.
,, 3	Truro—Convenience to School	Education Committee	A. J. Cornelius, Truro.
,, 6	London, S.E. Disinfectants	Lewisham Borough Council	Surveyor's Department, Town Hall, Catford.
,, 6	Dalkeith, N.B.—Cleaning, &c., Streets	Town Council	T. Sturrock, Town Hall, Dalkeith.
,, 6	Hastings—Sewers	Corporation	P. H. Palmer, Town Hall, Hastings.
,, 6	Grimsby—Disinfectants	Corporation	W. A. Vignoles, Corporation Electricity Works, Grimsby.
,, 6	Beckenham—Drainage of Roads	Urban District Council	J. A. Angell, Surveyor, U.D.C., Beckenham.
,, 6	Cheriton, Kent—Removal of Refuse	Urban District Council	Public Offices, Cheriton.
,, 7	London, N.—Sewer	London County Council	Maurice Fitzmaurice, County Hall, Spring Gardens, S.W.
,, 7	Swansea—Private Drainage Work	Corporation	Borough Surveyor's Office, 13 Somerset Place, Swansea.
,, 8	Chailey, Sussex—Sewer	Rural District Council	H. Weller, Batcombe, Lewes.
,, 8	London, W.—Drain Pipes	Hammersmith Borough Council	Town Hall, Hammersmith.
,, 9	London, W.—Disinfectants	Urban District Council	J. Barclay, Town Hall, Chiswick.
,, 9	West Ham—Sanitary Articles	Town Council	Borough Engineer's Office, Town Hall, Stratford, E.
,, 13	Dagenham, Essex—Sewers	Romford R.D.C.	W. Smith, 24 North Street, Romford, Essex.
,, 13	Blackburn—Sewerage, &c.	Corporation	W. Stubbs, Municipal Offices, Blackburn.
,, 15	Folkestone—Drain Pipes	Corporation	A. E. Nichols, Corporation Offices, Folkestone.
,, 15	Plymouth—Sanitary Fluid, &c.	Corporation	J. Paton, Borough Engineer, Plymouth.
,, 15	Hampstead—Drain Pipes, &c.	Council	Borough Engineer, Town Hall, Haverstock Hill, N.W.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Feb. 8	Wembley—Cottages	£50 & £25	£1 1s.	C. R. W. Chapman, Public Offices, Wembley.
,, 28	Aylesbury—School	£50 & £25	£1 1s.	C. G. Watkins, Education Office, Aylesbury.
,, 28	Wolverton—School	——	£1 1s.	C. G. Watkins, Education Office, Aylesbury.
Mar. 4	Nelson, Lancs—Library	£50, £25 & £15	——	J. Baldwick, Town Hall, Nelson.
,, 30	London, S.W.—Municipal Buildings	£3 3s.	——	H. J. Smith, Town Hall, Kennington Green, S.E.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

Coming Events.

Wednesday, February 1.

Institute of Sanitary Engineers.—Presidential Address and Paper on "The By-Laws," by Mr. J. A. Crowther, A.M.I.C.E., at 7 p.m.

Institution of Civil Engineers.— Students' Visit to the National Physical Laboratory, Bushy House, Teddington, at 2.30 p.m.

Thursday, February 2.

Civil and Mechanical Engineers' Society.—Meeting at Caxton Hall, Westminster, at 8 p.m.

Royal Academy of Arts.—Mr. Alfred Gilbert, R.A., on "Sculpture," at 4 p.m.

Society of Antiquaries.—Meeting at Burlington House at 8.30 p.m.

Chemical Society.—Meeting at Burlington House, Piccadilly, at 8 p.m.

Stock Exchange Art Society.—Sir W. B. Richmond on "St. Paul's," London Institution, at 4.30 p.m.

Friday, February 3.

Junior Institution of Engineers.—Prof. H. T. Davidge on "Recent Developments in Electric Lighting," Westminster Palace Hotel, at 8 p.m.

Monday, February 6.

Surveyors' Institution (Junior Meeting).—Discussion on "The Interpretation of Clauses in Leases," at 7 p.m.

Royal Philosophical Society of Glasgow.—Mr. David Cook on "The Relations of Proprietor, Architect and Contractor," at 8 p.m.

Liverpool Architectural Society.—Mr. J. B. Fulton on "How to attain Original Thought in Architecture."

Royal Institute of British Architects.—President's Address to Students, Presentation of Prizes, at 8 p.m.

Royal Academy.—Mr. Alfred Gilbert, R.A., on "Sculpture," at 4 p.m.

London Institution.—Mr. M. H. Spielmann on "The Wallace Collection," at 5 p.m.

Tuesday, February 7.

Northern Architectural Association (Students' Evening).—Mr. J. Bruce on "Stresses in an Iron Roof of 40ft. Span, with all Calculations," at 7.30 p.m.

Royal Sanitary Institute.—Conference on School Hygiene, University of London. First Day. Reception at 7 p.m. Presidential Address by Sir Arthur W. Rücker, at 8 p.m. Exhibition of School Building and Furnishing Appliances.

Wednesday, February 8.

Royal Sanitary Institute.—Conference on School Hygiene, University of London. Second Day. "Scholars," at 11 a.m. and 2 p.m.

Thursday, February 9.

Leeds and Yorkshire Architectural Society.—Miss Ethel Charles, A.R.I.B.A., on "Modern Architecture in London," at 6.30 p.m.

Royal Sanitary Institute.—Conference on School Hygiene, University of London. Third Day. Papers on "Building and Equipment" (discussion to be opened by Sir Aston Webb, R.A., F.R.I.B.A.), at 11 a.m., and on "Sanitary Inspection" (discussion to be opened by Dr. J. F. J. Sykes), at 2 p.m.

Royal Academy.—Mr. Alfred Gilbert, R.A., on "Sculpture," at 4 p.m.

Society of Antiquaries.—Meeting at Burlington House at 8.30 p.m.

Friday, February 10.

Glasgow Technical College Architectural Craftsmen's Society.—Mr. Charles Forsyth on "Architectural Photography," at 8 p.m.

Architectural Association.—Mr. C. S. Spooner on "Church Fittings," at 7.30 p.m.

New Companies.

British Radiator Co., Ltd. Capital: £5,000.

Silcock and Co., Ltd., dealers in bricks, tiles, &c. Capital: £3,000.

Barham Brick Kiln and Dryer Co., Ltd., 9 and 10, Pancras Lane, Queen Street, E.C. Capital: £20,000.

Sabey and Son, Ltd., builders and contractors, 3, St. Peter Street, Islington, N. Capital: £20,000.

Phœnix Tileries (to acquire the business carried on at the Phœnix Brick Works, Dudley Road, Wolverhampton). Capital: £20,000.

John G. Stein and Co., brick and tile manufacturers and merchants, clay workers, &c., Bonnybridge, Castlecary and Denny. Capital: £100,000.

G. O. Shepherd and Co., Ltd., timber and slate importers, joinery and moulding manufacturers, &c., 2, St. Peter's Terrace, Bournemouth. Capital: £10,000.

Yarrow and Co. (Bolton), Ltd., sanitary pipe makers and sanitary engineers, District Bank Chambers, Wood Street, Bolton. Capital: £10,000.

Excelsior and Phœnix Fire-resisting Partition and Ceiling Co., Ltd., Palmerston House, E.C. Capital: £20,000.

Concrete Machinery Co., Ltd. (to acquire from G. P. Campbell an invention for the manufacture of concrete hollow blocks). Capital: £5,000.

Central Wales Granite Co., Ltd., 13, Corve Street, Ludlow. Capital: £10,000.

R. Salisbury and Co., Ltd., builders, contractors, painters, decorators, &c., 69, Walton Street, Chelsea. Capital: £4,500.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

During the week ending January 27th twenty-two failures in the building and timber trades in England and Wales were gazetted.

D. J. Davies, builder and contractor, Blaengarw. Gross liabilities £4,244; deficiency £152.

T. Bagnall & Sons, builders, Oldbury. Liabilities £1,107; assets £143; deficiency £964.

Munday & Co., painters and decorators, Southend-on-Sea. R.O. Jan. 17th.

E. Stonham, builder, Ilford. P.E., London Bankruptcy Court, Feb. 21st, at 11.30.

W. Young, builder and contractor, Twyford. R.O. Jan. 19th.

E. Barnes, builder's merchant, Bolton. R.O. Jan. 21st.

J. L. Crumblehulme, late architect, Blackpool. R.O. Jan. 18th.

Townsend & Coles, builders and contractors, London. R.O. Jan. 20th.

H. Harland, painter, contractor and plumber, Hanley. R.O. Jan. 19th.

Newton & Burgess, builders and decorators, Clapham Junction. P.E., Wandsworth C.C., Feb. 9th, at 12.

S. Idenden, builder and contractor, Catford. R.O. Jan. 16th. First meeting, 24, Railway Approach, London Bridge, Feb. 7th, at 12.30. P.E., Greenwich C.C., Feb. 14th, at 1.

J. Leonard, builder, Rochester. R.O. Jan. 18th. First meeting, 115, High Street, Rochester, Feb. 6th, at 11.30. P.E., Rochester C.C., same day, at 2.30.

T. Wormald, stone merchant, Oldham. First meeting, O.R.'s, Oldham, Feb. 3rd, at 11.30. P.E., Oldham C.C., March 10th, at 11.

V. Wells, engineer, Boston. R.O. Jan. 16th. First meeting, O.R.'s, Boston, Feb. 8th, at 2. P.E., Boston Sessions House, Feb. 16th, at 1.

J. Slinger & Co., contractors, Cleckheaton. R.O. Jan. 17th. First meeting, O.R.'s, Bradford, Feb. 1st, at 3. P.E., Bradford C.C., Feb. 22nd, at 10.

T. Ward, painter, paperhanger and decorator, Sheffield. R.O. Jan. 18th. First meeting, O.R.'s, Sheffield, Feb. 1st, at 1. P.E., Sheffield C.C., Feb. 9th, at 2.

Advertising Notes.

He who expects his advertising to bring immediate results deceives himself as badly as does he who attempts to make his corn grow by pulling at the shoots.

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterward, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Monday.

ARCHITECT'S ASSISTANT disengaged; 9 years' varied experience; contract drawings, details, perspectives, &c., and office routine. Excellent references; moderate salary.—Box 863, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT AND SURVEYOR'S ASSISTANT, A.R.San.I., desires engagement. Nine years' varied experience. Measuring up, contract drawings, details, specifications, knowledge of quantities surveying and levelling, superintending works, &c.—H., 10, Rollscourt Avenue, Herne Hill, S.E. 886

ARCHITECT AND SURVEYOR'S ASSISTANT desires ENGAGEMENT in London or district. Temporary or permanency. Twelve years' varied London and country experience. Salary moderate. —R., 8. Buxton Road, Luton. 878

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ARCHITECT and SURVEYOR'S experienced Assistant, good surveyor, neat draughtsman, good all-round experience; moderate salary; excellent references.—DUDGEON, Sunnycroft, Fosse Road North, Leicester. 870

ARCHITECT and SURVEYOR'S competent ASSISTANT desires ENGAGEMENT; 12 years' good experience; thoroughly reliable.—H. W. A., Belinda, Newborough, Wimborne. 904

ARCHITECT'S ASSISTANT, 9 years' London experience; contract drawings from rough sketches, details, domestic work, perspectives, specifications. Renaissance work; salary moderate. Testimonials.—ARCHITECT, 32, Cambridge Gardens, Notting Hill. 872

ARCHITECT'S ASSISTANT (23), 7 years' experience, desires ENGAGEMENT; design, detail, surveying, levelling; usual routine, good references, salary 25s.—H. T. R., 26, Calthorpe Street, London, W.C. 868

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ARCHITECT'S ASSISTANT requires re-engagement, temporary or permanent; 14 years' good experience in large London office. Good testimonials. Salary £2 15s.—Address, R. A. A., Gould's, 54, New Oxford Street. 889

ARCHITECT and SURVEYOR'S ASSISTANT (25) desires immediate ENGAGEMENT in a busy office; working drawings, perspectives, quantities, &c.; excellent references; salary very moderate.—P. A., 11, Park Valley, Nottingham. 898

ARCHITECT and SURVEYOR'S ASSISTANT (21). Working and detail drawings, surveying and levelling, specifications, quantities. Moderate salary. Student R.I.B.A.—W. H., The Lawn, Kennington, Ashford, Kent. 900

ARCHITECT'S JUNIOR ASSISTANT requires ENGAGEMENT; 3½ years' experience in a London Architect's office. Well up in usual routine. Moderate salary.—A. C., 18, Hencroft Street, Slough. 860

ARCHITECT'S JUNIOR ASSISTANT desires engagement in a good London office, four and a-half years' experience; age 23; good references; salary moderate.—B. T. ATKINSON, jun., 14, Rosslyn Hill, Hampstead, N.W. 913

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BUILDER'S CLERK & DRAUGHTSMAN (23) seeks re-engagement; working and detail drawings, tracings, &c., quantities, and assist estimating, and usual routine, contract and jobbing.—A. T., Falconhurst Lodge, Edenbridge, Kent. 869

CARPENTER, used to Building and Jobbing or Estate work, seeks PERMANENCY.—21, Ormeley Road, Balham. 912

CLERK OF WORKS, shortly disengaged, seeks RE-ENGAGEMENT; good references—W. G. R., 17, Hastings Road, Blundellsands, near Liverpool. 866

CLERK OF WORKS seeks RE-ENGAGEMENT. Now completing re-erection of mansion after fire.—HOLDEN, Bolton Hall, Leyburn, Yorks. 893

ELECTRICIAN, Light, Bells, Telephones, Plant, wants WORK.—H., 23, Whitfield Street, Tottenham Court Road. 911

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he next ENTRANCE EXAMINATION will be held in ONDON and certain PROVINCIAL CENTRES on pril 18th, 19th, and 20th, 1905.

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See p. xx for the Employment Register.

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The Governors do not bind themselves to accept the lowest or any Tender.

TENDERS must be delivered before 12 o'clock noon on the 7th FEBRUARY 1905, addressed to the Clerk to the Governors of the Farnham Grammar School, E. Kempson, Esq., 121, West Street, Farnham, and endorsed "Tender for New Grammar School, Farnham."

E. KEMPSON,
Clerk to the Governors.

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A clause will be inserted in the Contract providing that the contractor shall pay to the workmen employed in the execution of the work the wages generally accepted as current for workmen engaged on similar work in the district.

Payment under the Contract will not be made until six months after the completion of the works.

Tenders, duly sealed and endorsed "Tender for Drainage Works," to reach undersigned not later than FOUR p.m., MONDAY, FEBRUARY 6th, 1905.

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By order,
F. STEVENS,
18th January, 1905. Clerk to the Council.

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FORAGE.		£	s.	d.	£	s.	d.
Beans	per qr.	1	14	0	2	0	0
Clover, best	per load	3	15	0	4	5	0
Hay, good	do.	3	10	0	3	17	0
Sainfoin mixture ...	do.	3	10	0	3	17	6
Straw	do.	1	12	0	2	2	0
OILS AND PAINTS.							
Castor Oil, French ...	per cwt.	1	0	5		—	
Colza Oil, English ...	do.	1	1	3		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0		—	
Linseed Oil, barrels ...	per cwt.	0	14	$10\frac{1}{2}$		—	
Petroleum, American ...	per gal.	0	0	$5\frac{3}{8}$		—	
Do. Russian ...	do.	0	0	$4\frac{3}{4}$		—	
Pitch	per barrel	0	8	0		—	
Shellac, orange	per cwt.	7	0	0	7	10	0
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	5	0		—	
Tar, Stockholm	per barrel	1	5	0		—	
Turpentine	per cwt.	1	18	0		—	
METALS.							
Copper, sheet, strong ...	per ton	80	0	0		—	
Iron, Staffs., bar ...	do.	5	17	6	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	7	6	10	10	0
Lead, pig, Soft Foreign...	do.	12	13	9	12	15	0
Do. do. English common brands	do.	12	18	9	13	0	0
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14	0	0		—	
Do. pipe	do.	15	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	5	0		—	
Do. floor brads... ...	do.	9	0	0		—	
Steel, Staffs., Girders and Angles	do.	5	10	0	6	0	0
Do. do. Mild bars ...	do.		0	0	6	5	0
Tin, Foreign	do.	131	0	0	131	10	0
Do. English ingots ...	do.	131	10	0	133	0	0
Zinc, sheets, Silesian ...	do.	28	0	0		—	
Do. do. Vielle Montaigne	do.	29	0	0		—	
Do. Spelter	do.	24	15	0	25	0	0
TIMBER.							
SOFT WOODS.							
Whitewood, American, logs.	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	1	6
Fir, Dantzic and Memel	per load	2	7	6	4	15	0
Pine, Quebec, Yellow ...	do.	4	0	0	7	0	0
Do. Pitch, American...	do.	2	10	0	6	0	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, Söderhamn, Yellow, 3rd, 3×9,	per std.	12	15	0	13	0	0
Do. Archangel Larchwood, Unsorted, 3×9	do.	8	15	0			
Do. Kallskar Yellow, 6th, 3×9	do.	7	5	0	7	10	0
Do. St. Petersburg Yellow 1st, 2½×7	do.	9	5	0		—	
Do. do. do. 2nd, 3×9	do.	8	5	0		—	
Do. do. do. do. 2½×7	do.	9	0	0		—	
Do. Abo, White, Unsorted, 3×8	do.	8	0	0		—	
Do. do. do. do. 3×7	do.	7	15	0		—	
Do. Wasa, Yellow, 1st and 2nd, 3×8	do.	8	10	0		—	
Do. do. do. do. 2½×7	do.	8	10	0		—	
Battens, all kinds ...	do.	5	15	0	9	10	0
Flooring Boards 1in. prepared, 1st... ...	per square	0	9	3		—	
Do. 2nd	do.	0	9	0	0	9	9
Do. 3rd, &c.	do.	0	6	6	0	7	9
HARD WOODS.							
Ash, Quebec	per load	4	10	0	7	15	0
Birch, New Brunswick...	do.	2	15	0	6	0	0
Box, Turkey	per ton	8	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	$3\frac{1}{2}$		—	
Do. Honduras ...	do.	0	0	$5\frac{7}{32}$		—	
Do. Tobasco	do.	0	0	$5\frac{3}{32}$		—	
Elm, Quebec	per load	4	5	0	8	15	0
Mahogany, Average Price for Cargo, Honduras...	per ft. sup.	0	0	$4\frac{5}{8}$		—	
Do. African ...	do.	0	0	$3\frac{11}{32}$		—	
Do. St. Domingo	do.	0	0	4		—	
Do. Cuba ...	do.	0	0	$6\frac{1}{4}$		—	
Do. Lagos ...	do.	0	0	$4\frac{7}{32}$		—	
Do. Benin ...	do.	0	0	$2\frac{21}{32}$		—	
Do. Tobasco ...	do.	0	0	$4\frac{31}{32}$		—	
Oak, Wainscot	per log.	2	5	0	5	15	0
Do. American quartered, planks and boards	per ft. cu.	0	2	6	0	5	0
Do Dantzic & Stettin	per load	3	0	0	6	10	0
Do. Quebec	do.	5	0	0	8	0	0
Teak, Rangoon, planks...	do.	8	0	0	15	10	0
Do. Indian logs ...	do.	10	0	0	18	10	0
Do. Indian planks ...	do.	13	0	0	20	0	0
Do. Moulmein logs ...	do.	6	10	0	8	0	0
Kaurie pine logs	per ft. cu.	0	1	6	0	2	0
Do. do. planks ...	do.	0	3	0	0	3	6

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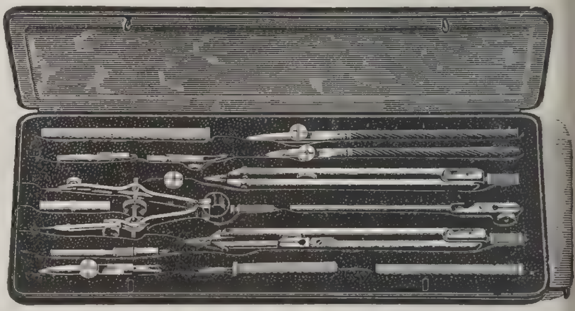
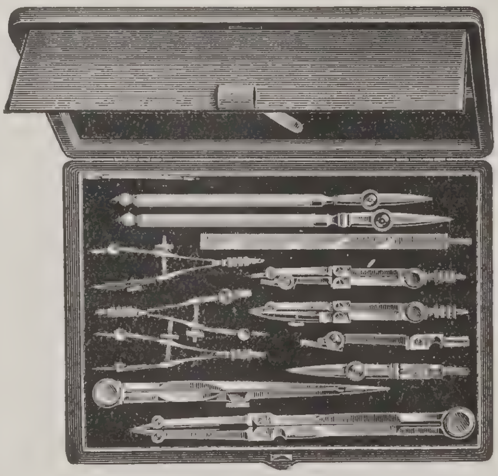


No. 46.



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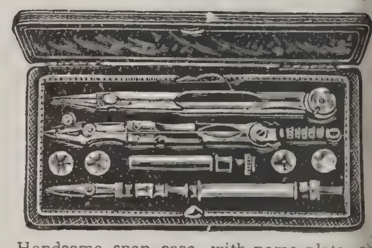
Nos. 69-40.



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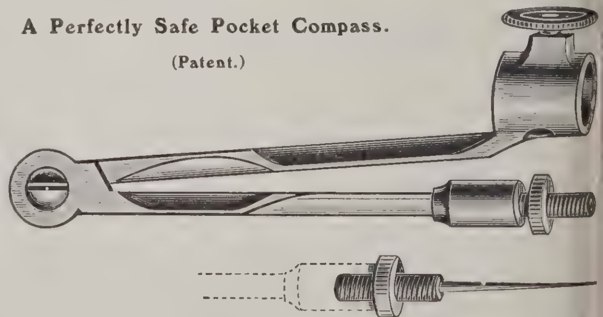

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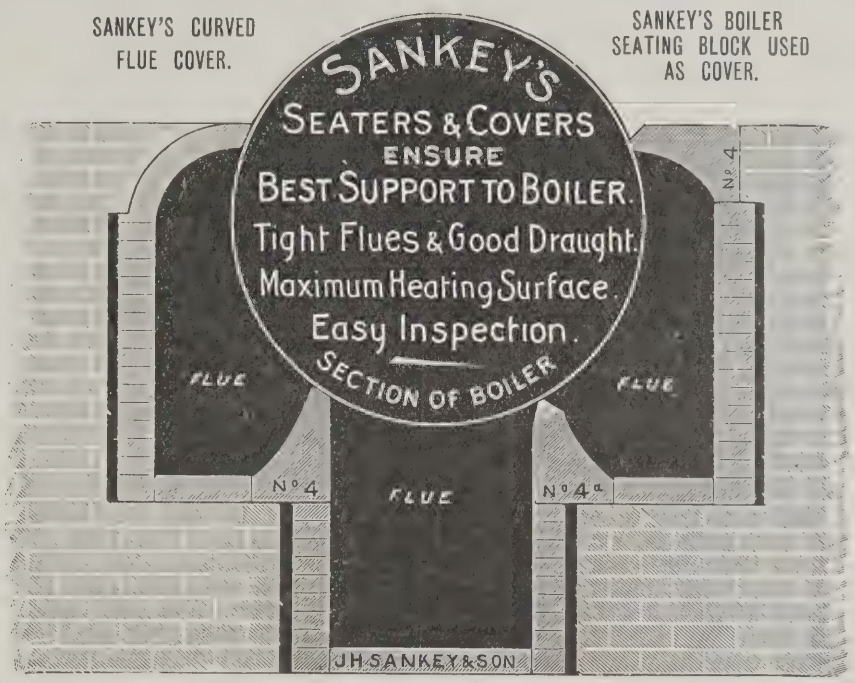

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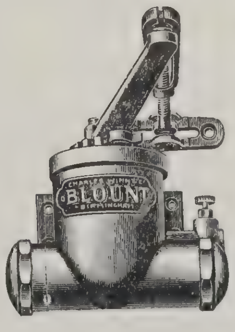

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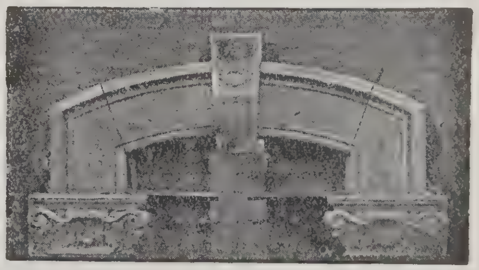

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Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Cheveley (near Newmarket).—Messrs. Arthur Rutter, Sons & Lloyd, of 63, Sidney Street, Cambridge, write stating that they are the architects of the house for Mr. S. W. Graystone, not Mr. H. Steward-Watling, as stated on p. xvi of our issue for December 14th last.

Cricklade (Wilts).—For the construction and maintenance of water-supply works, for the R.D.C. (concrete collecting trench, brick engine-house and store, concrete filters and tanks, covered service reservoir of 50,000 gallons capacity, mains, &c.). Mr. F. Redman, engineer, 34, Wood Street, Swindon, Wilts :—

J. Simmonds, Gloucester	£5,565
Davies, Ball & Co., Thame	4,939
E. Tabor, Cambridge	4,937
S. W. Harrison & Co., Birminghan	4,796
Docwra & Son, London	4,796
A. J. Colborne, Swindon	4,736
Cruwys & Hobrough, Gloucester	4,592
Mackay & Sons, Edinburgh	4,555
C. T. Perkins, Heath, near Cardiff	4,530
Meredith Brothers, Gloucester	4,489
Hull & Son, Nottingham	4,383
G. Rutter, Barry	4,372
H. Roberts, Ledbury	4,278
J. W. Dean, Ltd., Westcott	4,179
Muirhead, Greig & Matthews, London	4,134
J. Riley, Cheltenham	4,085
Moran & Son, London	4,047
Rowell & Son, Chipping Norton	4,036
Wright & Son, Glastonbury	3,787
H. Flewelling, Wootton Bassett	3,750
W. B. Winchcombe,* Wroughton, near Swindon	3,748

* Accepted.

Croydon.—For the erection of cottage, cart, tool and steam-roller sheds at stores depôt, Bute Road, Wallington, Surrey, for the R.D.C. Mr. Robert Masters Chart, F.S.I., architect, Union Bank Chambers, Croydon :—

E. Streather, Croydon	£2,147
Dashwood & Sons, Wimbledon	1,725
Howe & White, Wallington	1,672
Smart & Son, Pitlake	1,646
Myall & Upson, Clacton-on-Sea	1,544
Whitehead Brothers, Clapham	1,533
Hudson & Co., London and Wimbledon	1,525
Gathercole Brothers, Norbury	1,500
Jones & Son, Sutton	1 500
Smith & Sons, Croydon	1,493
Burges & Sons, Wimbledon	1,450
C. Sayers, Mitcham	1,450
C. Waller, Croydon	1,450
T. Pearce, Thornton Heath	1,446
Stewart & Sons, Wallington	1,438
Roberts, Croydon	1,436
E. J. Burnand, Wallington	1,390

London, S.E.—For the erection of proposed factory, Carmarthen Place, Bermondsey Street. Mr. John M. Kennard, architect, 13, Railway Approach, S.E. Quantities by the architect :—

A. Wobber	£3,037
B. Wells	2,850
J. Bullers	2,820
J. Norris & Sons	2,796
Potten & Son	2,700
Rider & Son	2,623
W. Shepherd	2,555
J. Renwick	2,537
Howell J. Williams Ltd.	2,465
J. Greenwood, Ltd.	2,383

London.—For the enlargement of the Eastern District Post-Office, for H.M. Office of Works, &c. :—

		A.
Multon & Wallis	£23,900	—
J. F. Holliday	23,871	£200
W. King & Sons	23,700	—
Stimson & Co.	23,400	—
J. Mowlem & Co,, Ltd.	22,990	158
General Builders, Ltd.	22,497	37
Foster Brothers	22,330	—
W. H. Lorden & Son	22,138	171
H. J. Williams, Ltd.	22,100	—
L. H. & R. Roberts	21,977	200
Leslie & Co., Ltd.	21,942	120
W. Johnson & Co., Ltd.	21,932	832
W. Gladding & Co., Ltd	21,699	204
Martin, Wells & Co., Ltd.	21,580	80
F. & A. Willmott	21,274	140
Higgs & Hill, Ltd.	21,163	150
J. Smith & Sons, Ltd.	20,870	250
Edwards & Medway	20,560	230
F. & T. Thorne	20,509	110
J. Shelbourne & Co.	19,782	221
B. E. Nightingale	19,745	104
Perry Brothers	19,657	100
J.Garrett & Sons	19,066	345

A.—Credit old materials.

London, N.—For the erection of a residence in Hendon Avenue (Woodway Lodge), Finchley, for Mrs. J. A. Tunstall. Messrs. Bennett & Richardson, architects, Broadway, Finchley. Quantities by architects :—

W. Tont	£1,908
J. Willmott & Sons	1,897
G. Godson & Sons	1,847
Patman & Fotheringham	1,823
Sheffield Brothers	1,793
F. Gough & Co.	1,781
Mattock & Parsons	1,777
H. C. Clifton	1,758
Mattock Brothers	1,732
Edwards & Medway	1,715
W. Lawrence & Son*	1,644
S. L. Grtst	1,444

* Accepted.

London, N.—For the erection of a residence in Hendon Avenue, Finchley, for Mr. Edwin Pringle. Messrs. Bennett & Richardson, architects, Broadway, Finchley. Quantities by architects :—

W. Tont	£1,274
W. G. Larke & Sons	1,223
Patman & Fotheringham	1,186
H. C. Clifton	1,154
C. F. Day	1,104
W. Lawrence & Son*	1,074
J. Phœnix	1,060

* Accepted.

London, N.—For the erection of a residence and stabling in Hendon Avenue, Finchley, for Mr. J. E. Arnold. Messrs. Bennett & Richardson, architects, Broadway, Finchley. Quantities by architects :—

G. Godson & Sons	£2,954
W. Tont	2,710
A. Quibell	2,640
F. Gough & Co.	2,634
Mattock & Parsons	2,617
Patman & Fotheringham	2,593
Chapman Brothers	2,590
W. Lawrence & Son	2,549
H. C. Clifton	2,542
J. Phœnix*	2,540

* Accepted.

Norwich.—For the erection of a house on Newmarket Road, for Mr. A. Banister. Messrs. Morgan & Buckingham, architects, Norwich :—

J. Holmes	£1,588	0	0
J. S. Smith	1,385	0	0
T. Gill	1,249	0	0
S. W. Utting	1,217	0	0
J. Evans*	1,171	10	0

* Accepted. [All of Norwich.]

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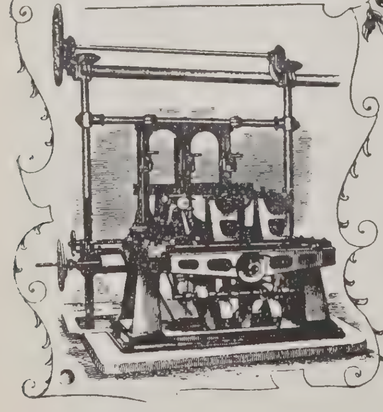

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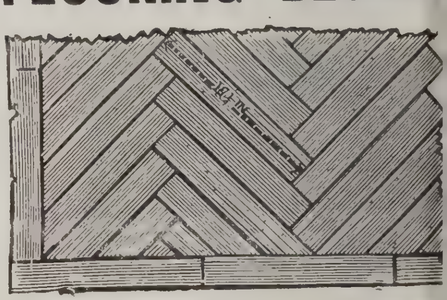

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THE

BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

February 8, 1905. Vol. 21, No. 522.

6, Great New Street, Fetter Lane, E.C.

Summary.

Sir Aston Webb has been selected by the Royal Institute of British Architects as a fit recipient of the Royal Gold Medal, 1905. (Page 72.)

In his address to students Mr. John Belcher, A.R.A., urged the importance of laying a good foundation in a practical knowledge of the art of construction and the right use of materials. (Page 72.)

At the cathedral of St. John, New York, some huge granite columns have been erected. They are in two parts, the lower part weighing 90 tons and the upper part 40 tons, and very great difficulties have been experienced in turning them in the lathe, transporting them through the streets, and erecting them in position. The original intention was to have each column in one piece, but it was found impossible to polish them in the lathe, every attempt to do so resulting in fracture. The columns were carried through the streets on a very stoutly built wagon—hauled from point to point by an engine. Altogether they have cost £31,000. (Page 70.)

In a paper on ventilation Mr. J. D. Sutcliffe says that he has never been able to substantiate the claims made by manufacturers that their particular cowls will produce strong extraction currents of air in all weathers. Heat is necessary if such effective extraction is wanted. A good-sized Bunsen burner fixed just above the ceiling line in an outlet turret is a help, but a better arrangement is a special heating battery. (Page 76.)

£130,000 is still needed for Liverpool Cathedral. (Page 80.)

Mr. Frederic Harrison writes condemning the proposed frontage line of the improvement scheme between the two churches in the Strand. (Page 81.)

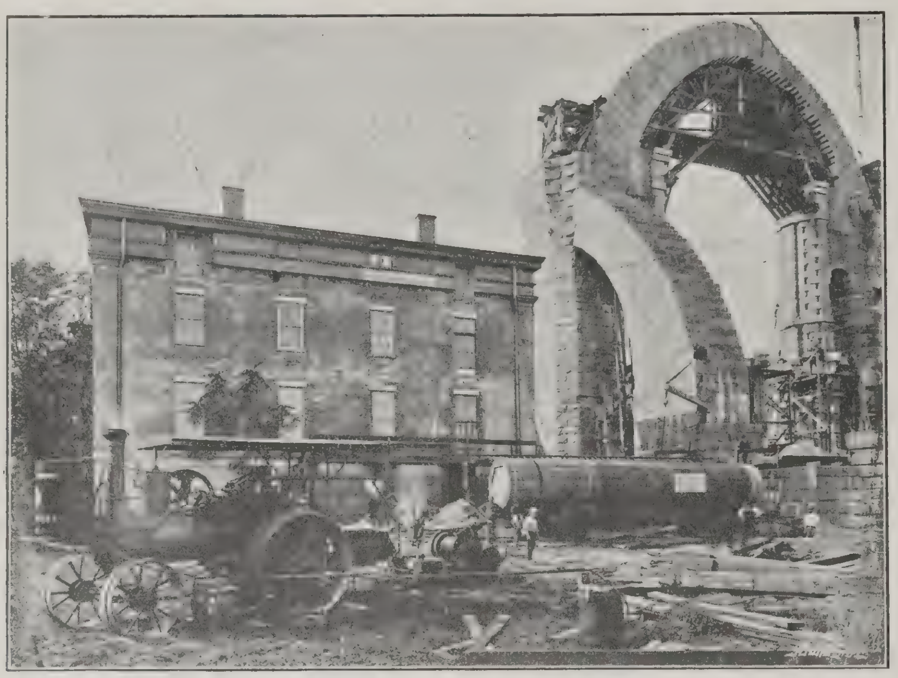
The large new hotel which is to be erected in Piccadilly according to the design of Messrs. William Woodward & Walter Emden, joint architects, will provide thirty shops on the ground floor, together with a large restaurant, lounge, &c. The elevation to the Quadrant is not yet settled. (Page 72.)

Mr. Cyril F. Fryer (Palgrave & Co.) calls attention to the fact that an architect (as distinguished from an estate agent) cannot recover a fee or commission from a vendor when he (the architect) introduces a purchaser of a property which is to be developed under his direction. (Page 75.)

The late Mr. J. T. Wimperis, F.R.I.B.A., died worth £51,430. (Page 80.)

To Our Readers. As our readers will notice by this issue, we have decided for the future to publish only one plate every week, except when something of very special interest or importance arises. This decision has been dictated by several considerations. First we may mention that the quality of the paper on which THE BUILDERS' JOURNAL is printed has been so much improved within the last few years that the illustrations in the text are now quite as good as in the plates, the only advantage of the latter being that they allow large illustrations to be given extending over two pages. As a rule, however, one plate per week is sufficient for the adequate reproduction of drawings or photographs. Secondly, there is the important consideration of what is most appreciated by our readers. It must not be forgotten that latterly a great change has taken place in respect to the practice and study of architecture and buildings, more particularly in regard to the attitude taken up towards antiquarian and historical knowledge as contrasted with the scientific knowledge of construction and practice to-day. Thus there is a far greater appreciation of instructive articles on new buildings and methods than of mere collections of architectural perspectives forming "picture-books." We hold the view that the purpose of a technical journal is not to amuse but to aid its readers by the record of facts, news and advances made in artistic and scientific practice, and the support we have received confirms us in this belief. Our articles on buildings in course of construction illustrated with photographs have met with a flattering reception, while our enquiry column is one of our most popular features. We find that our readers would prefer expenditure to be devoted to the extension of this policy rather than on an extra plate. In this connection we may call attention to our new Fire Supplement, another number of which will be given with our next issue.

Paris in London. PEOPLE in the provinces are naturally not much interested in many London affairs to which considerable space is devoted by the Press, and, bearing in mind that we address ourselves to readers in all parts of the Kingdom, we endeavour to avoid giving undue attention to matters of merely metropolitan interest; but, after all, the biggest things are done in the capital, and in a sense the reputation of the nation mostly depends on its chief city; so that we make no excuse for again referring to the Strand improvement scheme, more especially as the fate of it, after so many hopes and fears, now seems to be settled. A proposal of great interest has been made to the Council on the strong recommendation of its Improvements Committee. It is no other than the letting of the central part of the Strand island site to a French syndicate at the huge ground rent of £55,000 a year for 99 years. The proposal has been made by Mr. W. Gilbee Scott, F.R.I.B.A., and Mons. Ernest Gérard, acting on behalf of the syndicate. It is proposed to erect merely on the middle portion of the site "a fine stone building of commanding architectural features." This central building will be of an average height of about 60ft. and it will consist of a basement with ground and first floors only, containing large galleries for use in connection with art and industrial exhibitions. A French theatre and a French restaurant and café of the highest class will also be included in the central block of buildings. Beyond the central block of buildings the site will be enclosed by shops, with basements and ground and first floors only, the height above the ground-level being about 27ft. The space between the central block and the shops will be laid out as gardens and ornamented with fountains, statues and flower beds. A charge will be made for admission to the grounds. The roofs of the shops will be used as a promenade, to which access will be obtained from the gardens. It is also proposed to erect an open-air theatre for summer use. The promoters anticipate that the buildings surrounding the site will be let to French jewellers, bootmakers, milliners, confectioners, stationers, &c., or will be used as clubs, offices, or for other commercial purposes. The elevations of the buildings and the lay-out of the grounds will be subject to the approval of the Council. So much for the facts. And what if such a scheme were carried out? As yet no designs have been put forward, and it is therefore impossible to form a judgment of the architectural effect. But, meanwhile, we have the names of Mr. Gilbee Scott and M. Gérard to conjure with; the former very little known to the architectural public and the latter an absolute stranger. The Improvements Committee positively trembles at the great ground-rent now actually within reach: and hastens to inform the Council that the acceptance of the proposal in no wise affects the memorial in regard to the height of buildings. The Committee is eager that the chance shall not slip by. Peace to them!



VIEW SHOWING TRACTION ENGINE, HOIST AND COLUMN ON TIMBER WAGON.

130-TON GRANITE COLUMNS.

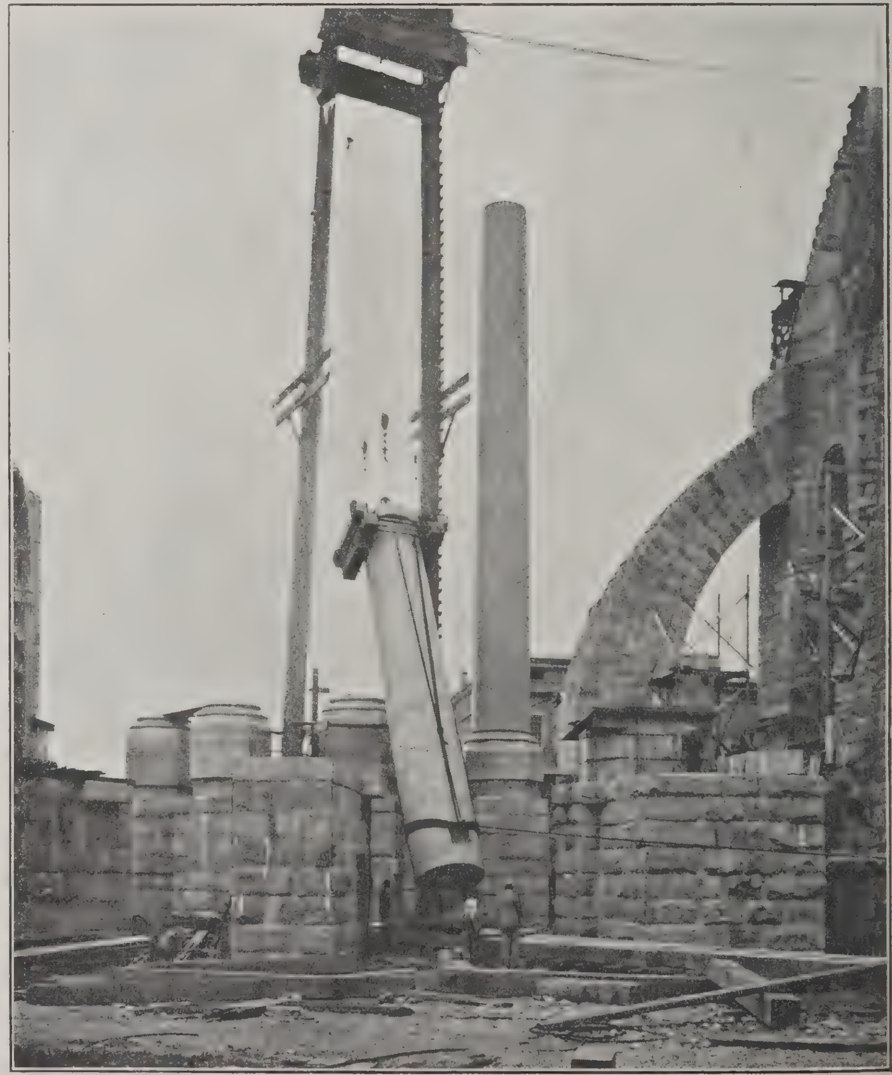
We give this week a series of photographs showing the erection of the huge granite columns at the Protestant episcopal cathedral of St. John the Divine, New York, the architects for which are Messrs. Heins & La Farge. These columns, of which there are eight, form a semicircle around the altar. Each is 6ft. in diameter and 54ft. in height, in two pieces, the lower one being 36ft. long and weighing 90 tons, and the upper one, seated without dowelling on its flat top, being 18ft. high and weighing 40 tons: so that each entire column weighs 130 tons.

At first it was intended to make them monolithic, and no special difficulty was experienced in quarrying full-length slabs from a stratum of about the required thickness. These were hand-dressed approximately cylindrical, and the first one was successfully turned in a specially constructed lathe (said to have cost £9,000), but broke while being polished. The break was attributed to torsion, and for the second column power was applied at both ends of the lathe. But notwithstanding this arrangement, the column broke during the roughing. It was then suggested that the trouble lay with the excessive bending stresses due to the very long unsupported length. A centre support therefore was provided for the third column, but this column broke more quickly than either of its predecessors, and the attempt to make them monolithic was then abandoned.

The shorter pieces were turned and polished without difficulty, and were afterwards enclosed in cylindrical cases made with 3in. by 4in. steel-hooped wooden staves set close together and secured to circular end-pieces. They were loaded on barges, two complete columns to each, and towed to New York from the quarries at Vinalhaven, Me. Skids were arranged from the deck to the shore, and several turns of wire cable were taken around the middle of the column. One end was made fast to a hoisting engine, and the free end was kept tight as the rope was overhauled, rolling the column easily to shore. Each piece was loaded on a special wagon and transported over a mile through the city streets and up a considerable grade to the site.

The wagon (here illustrated) was built in Maine expressly for use on this work, and is of simple and massive construction. It consists of two pairs of wheels, two longitudinal beams and two cradles on the axles, and is built entirely of wood, except the axles, tires and a few bolts and small braces. The 10in. by 12in. longitudinal timbers are 30ft. long, $3\frac{1}{2}$ft. apart on centres, and overhang the front and rear axles about 2ft. and 5ft. respectively. The 8in. by 8in. rear axle and the 7in. by 7in. front axle each have six **U**-bolts fastening a solid 10in. by 14in. wooden bolster to the upper side. On the front axle the bolster supports a horizontal wooden turntable platform or fifth wheel, on which the longitudinal timbers are seated. At the rear end they are seated directly on the bolster. Solid fillers are put on the axles between and above the longitudinals and are concaved on the upper surface to a radius of 3ft. to receive the columns, which are thus supported about 4ft. clear of the pavement. The rear wheels are about 4ft. and the front wheels about 3ft. in diameter, all of them being 20ins. thick and made with seven thicknesses of planed white oak plank. Each thickness is made of sixteen sectors in the large wheel and twelve sectors in the small wheel, bolted together and breaking joints in adjacent thicknesses. A steel disc is bolted to the centre of the wheel on each side, and through it and the solid planks a hole was bored to fit the axle, so that the bearing of the latter is on the ends of the fibres. The tires consist of four 5in. by 1in. welded rings sunk on each wheel. The rear wheels are provided with a break-shoe operated by a screw, but it has been seldom necessary to use this, most purposes being served by a transverse timber chained to the axle and dragging on the ground close to the wheels, but clear of them so long as the wagon advances. If the wagon tends to move backwards, the timber immediately serves to chock the wheels.

The operation of hauling the wagon along the streets was interesting. Instead of inserting timbers in the ground to secure purchases, two iron hooks were used, a paving block being taken up, the hooks fixed in the



HOISTING LOWER PORTION OF COLUMN (90 TONS) ON TO BASE.

SETTING COLUMN ON BASE.

·ound and kept in place by placing a action engine over them, and the haulage ·en slowly effected by winding on the engine. his system worked satisfactorily and the agon did not cause any injury to the pave- ent. The first column section was drawn om the dock pier to the site in nineteen ays, while some of the others were drawn seven days each. The eight columns were ansported in about six months with a body four men and a superintendent.

At the site the column sections were volved into vertical positions and hoisted three tackles forming a 30-part system spended from a shear legs or breast derrick ade with two Oregon pine timbers 98ft. ng, hewed 2ft. square for the lower 30ft. and pered thence to a diameter of 20ins. at the p, where they are capped with an oak mber. From this timber were suspended pair of 10-part tackles and a single 6-part ckle in the centre, all of them reeved with n. steel rope. The centre tackle was an dependent one operated by a separate oisting engine. The two side tackles were eved with a single line common to both as to equalize the stress between them and rry through single top and bottom sheaves as to make up the thirty parts and lead each d to a separate Lidgerwood hoisting engine. y this arrangement equilibrium was main- ined between all parts of the tackles, and e stresses were equalized, no matter whether e engines were working uniformly or simul- neously or not. It was considered that the centric stress in revolving the column from e horizontal to the vertical position would dangerous for lewis bolts, and a special evice was adopted for attaching the tackles the upper ends of the columns during this art of the operation.

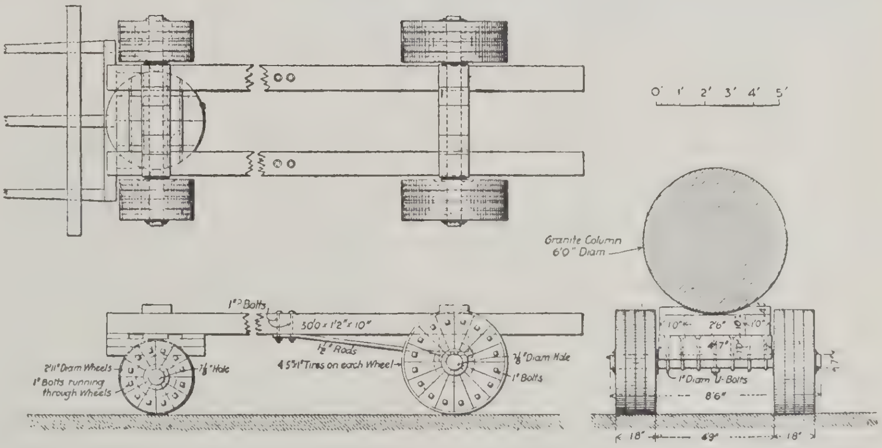
The 90-ton bottom sections of the columns ad been turned and polished up to a distance 18ins. from the end, where a rough shoulder a diameter of about 10ins. greater than the aft was left to form a collar. On the other side of this collar a pair of concaved yoke pieces were bolted to and took bearing against it. Through each side was set a $2\frac{3}{4}$in. **U**-bolt, to which a sling was attached to receive the tackles. The lower end of the column was lifted and placed on rollers, tackles were attached to the upper end and operated to drag the column forward and lift it into a vertical position, when it was seated on the permanent base. The yokes were then removed and the enlarged upper end of the column was scabbed off by hand and the surface dressed perfectly horizontal to a line marked by a diamond on the polished surface of the shaft.

The 40-ton upper sections of the columns were handled differently. No collar was left on the end of the shaft, which was dressed to the exact dimensions. Two clamps made with pairs of solid oak yokes connected by two $1\frac{3}{4}$in. and two 2in. screw rods at each end were fitted to the top of the column about 16ins. apart and screwed up as tight as possible so as to develop a large amount of friction. A **U**-bolt of 2in. iron was attached to one side of the upper yoke, and a similar one was attached to the other side of the lower yoke, passing freely through a slot in the upper yoke. The hoisting sling was connected to these **U**-bolts and thus developed balanced eccentric stresses in both yokes, tending to cramp each one against the column and increase the friction, but maintaining equilibrium between themselves. This connection sufficed to revolve the column into a vertical position. It was temporarily seated on the lower end, the yokes removed, and a lewis bolt inserted in the top. The tackles were connected to the lewis bolt and lifted the column and seated it on the top of the lower section in its permanent position.

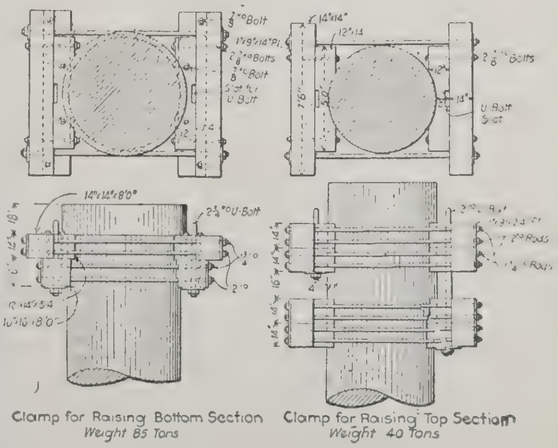
It required about one month to set up both sections of the column and prepare for the setting of the next column, but when everything was in readiness the actual hoisting of the column occupied only a very few minutes. The total cost of the eight columns has been about £31,000.

Mr. John Pierce, of New York City, was the general contractor for furnishing the columns. The work of transporting and erecting them has been carried out by Messrs. The Jones Brothers Co., of Boston.

The erection of the cathedral was begun thirteen years ago, and the work will not be completed for a long time to come. The following are the chief dimensions of the building:—Total external length, 520ft.; width across front, 190ft., across transepts, 290ft.; height of central spire, 425ft; height of four flanking towers, 160ft.; total exterior diameter of central tower, 116ft.; height of vaulting, 230ft.; height of western towers, 245ft.; total area of cathedral, 99,500 sq. ft.



TIMBER WAGON FOR TRANSPORTING COLUMNS.



Clamp for Raising Bottom Section
Weight 85 Tons

Clamp for Raising Top Section
Weight 40 Tons

FRICTION CLAMPS FOR TOPS OF COLUMN SECTIONS.

TACKLE AND FRICTION CLAMP ON HEAD OF COLUMN.

OUR PLATE.

WE this week give the Piccadilly elevation of the new hotel which is to be erected on the site bounded by Piccadilly, Regent Street, Air Street and Piccadilly Place, now occupied by the St. James's Hall and Restaurant and adjoining business premises. The property belongs to the Crown, and it is a stipulation that the Piccadilly frontage shall be set back 20ft. so as to widen the thoroughfare to 80ft. Upwards of half a million sterling has been expended in acquiring the site, and when the hotel and shops are erected and the hotel equipped, an actual cash expenditure of more than one million pounds will have been made. We hope soon to be able to give the elevation to the Quadrant; as however that elevation must necessarily form the basis of the designs for the whole future Quadrant very great consideration is being given to the subject by the Treasury, the Office of Woods, and the architects (Messrs. William Woodward and Walter Emden). The whole of the elevations are to be executed in Portland stone and under the hotel, on all frontages, will be shops. The roofs will be covered with green slates and the domes with golden and richly-coloured Spanish tiles. The planning of the building has involved very great consideration in regard to the requirements of a large modern hotel. There will be twelve shops fronting Piccadilly, eleven shops fronting Regent Street, three shops fronting Piccadilly Place and four shops fronting Air Street, and all will comprise ground floor with a mezzanine above and a mezzanine basement. The accommodation in the hotel will be:—On the ground floor: entrance halls from Regent Street and Piccadilly, a large restaurant, lounge, kitchen, cloak-rooms and lavatories. In the basement: a grill-room, dining-room, lounge and smoking-room, billiard-room and usual offices. In the sub-basement: Turkish baths and rooms used in connection therewith, lavatories, cellars, &c. On the seven upper floors 314 rooms, seventy-four bathrooms, w.c.'s, services, passenger lifts, goods lift; lounges on the second and third floors and a masonic temple on the latter floor; on the first floor, three dining-rooms, a drawing-room, reading- and writing-room, lounge and servery, &c. A contract for the erection of the building has been entered into with Mr. H. H. Bartlett, carrying on business as Messrs. Perry & Co., of Bow.

The Case for Architects' Registration. — One of the latest additions to the profession of architecture is a pensioner from the ranks of the Royal Engineers, who, after leaving the Army, set up in business as a fish salesman! This gentleman now advertises in the local papers as an architect and surveyor, and states that he is "prepared to execute plans and designs for all kinds of proposed new works, buildings, structural alterations, &c. Valuation of properties. Professional advice given on all architectural points! Moderate charges! Patronage earnestly solicited." Here's a case for the registrationists!

R.I.B.A.

President's Address to Students; Criticism of Designs.

A MEETING of the Royal Institute of British Architects was held on Monday evening, the chair being occupied by the president, Mr. John Belcher, A.R.A.

Mr. Graham, hon. secretary, announced the decease of two members: Mr. George Hurst Stanger and Mr. Walter Aston. He also stated that the late J. T. Wimperis left £1,000 at the entire discretion of the Council, and that Mr. Macvicar Anderson had given nineteen Architectural Union shares and Sir Aston Webb twenty-four shares for the purpose of promoting architectural education.

It was announced that the Council had selected Sir Aston Webb as a fit recipient of the Royal Gold Medal this year.

Mr. Belcher then delivered his address to students and Mr. A. N. Prentice, F.R.I.B.A., followed with a criticism of the drawings and designs submitted for the prizes and studentships this year.

Mr. Belcher said:—I should like to suggest certain methods to be adopted in the study of examples. The student's first impulse perhaps is simply to annex the whole subject as "stock" or "copy." Now certainly it is a very right and proper thing to sketch the building as a whole; but while doing so we must not let our thoughts lie idle; we should endeavour to discover why the subject is beautiful or admirable, what are the elements in it which have contributed to that result. At first, it may be, such an effort seems to go unrewarded; but if the habit be persisted in, intelligent perception will awaken, little by little the light will grow, and soon it will be quite easy to disentangle from the mass, as it were, those characteristics, those laws, those conditions, which have made the building what it is.

While traversing some particular line, for instance, note its relative proportions to the

HOISTING TOP PORTION OF COLUMN (40 TONS) INTO POSITION.

other parts. Follow out, if you can, the methods of construction, and mark how the effects are produced. Examine the general masses from various points of view and study the composition of your subject, not only in respect of its component parts, but also in relation to its environment. The latter is of great importance, for one of the chief elements of success in a building is its adaptation to its surroundings. Here it is especially that "scale" comes in, for the scale of a building must be either in keeping with or in contrast to adjoining buildings or objects, just as colours must either match exactly or be complementary to one another. Scale is relative and determines the proportion of one part to another and of the several parts to the whole. It is like the dominant note or key in a musical composition.

You are probably, all of you, aware that sounds which harmonize and please the ear have fixed relations to one another. Colour also has its divisions and harmonies, and you will not get far in architecture without discovering that here also similar laws hold good and that there is such a principle as a true proportion of parts in the scale of building. It is only by a diligent study of, and a careful regard for, these laws that we can effect a harmonious composition, which all the same can never be merely mechanical in architecture any more than it can in music. There is as wide a range of possible combinations and developments in the one case as the other.

You should also have regard to the aspect of the building you are studying—whether it is situated in the narrow street, the broad thoroughfare or in open ground. Note how the projections and lights and shadows are determined on each frontage. Where the sun penetrates reflected light may be taken advantage of. Projections and shadows on a south front are by no means the same as they would be with a north aspect.

It is only thus by analysing and searching out the guiding principles which have actuated men in the past that we shall really profit by a study of their work. If we can discover the sequence of thought which has guided them in the achievement of fine results, we in our turn may, by taking thought, successfully work out the problems which come before us. Depend upon it, that which we admire in their work is not the result of careless, accidental or haphazard arrangement of materials. No, there is thought behind it all, and the best results are just those upon which the best thought has been expended. If genius is not, as it has been defined, "an infinite capacity for taking pains," at any rate in architecture it is very nearly akin to an infinite capacity for taking thought.

Do not be misled by the apparent simplicity of much of the best work, for this very simplicity, if not the outcome of profound thought, is the triumph of a practised genius. "Through the complex to the simple" is almost a law of mental evolution.

Archæology has its place, but it should be kept there. It often usurps the interest and attention which ought to be given to the example as architecture. The glamour of historical romance has served to invest many a building with a purely fictitious value. The accidental effects of age and decay appealing to the sentiment of the man pervert the judgment of the artist, to his own detriment and that of his art. The same sentimental halo, hanging around all that is ancient, is responsible for the many imitations, forgeries and affectations which have so long dogged the footsteps and hindered the progress of genuine architecture, and which in some cases have proceeded to such an extreme of absurdity as to tempt men to forswear the past altogether and to rely upon their own creative faculty to invent something altogether new. This is the other extreme of folly—for folly it is to think that our inherited traditions can be safely ignored, or that buildings which have stood the test of time and criticism have nothing to teach us. They are, on the contrary, as mines of wealth in which, digging deep, we shall unearth many a hidden treasure. They put before us problems—and their successful solution. They portray many various methods and effective combinations, suitable forms adapted to different materials, varied textures serving a definite purpose, and other elements of beauty and strength which, if not always entirely realized, are yet present as an ideal which we may all study with advantage and strive to express in our own work.

So I say to you, my youthful fellow-students, Steer an even keel, if you can, between the Scylla of a superstitious and sentimental regard for the past and the Charybdis of a contemptuous indifference to all its works. If an example is merely old, leave it alone; if it is artistically good, approach it with all reverence, and examining its structure within and without endeavour to discover the secret of its charm, even as a bee extracts the honey from the flower. Do not make the mistake of supposing that you will necessarily be able to define the exact nature of the secret.

There are principles of architecture as absolutely reliable and yet as vague and ill-defined, as much "in the air," if you will allow the expression, as the laws which govern musical progressions or the methods which underlie true literary form. In no one of these cases can the subtle secrets of the art be distilled in the form of express and mechanical rules. If we desire that our own powers may be moulded and guided on true lines, we must, as it were, live in the storehouses, continually absorbing the spirit of the masters as embodied and expressed in their works. Centuries of experiment and criticism, generation after generation of trained perceptions and cultured intelligence, have gone to determine what is good, what is beautiful, what is true. Shall we throw away the results of all this? Rather let us recognize and admit that our knowledge should be based upon the experience of those who have gone before, and our taste trained and refined in the study of the cultured monuments of the past.

In all good work we shall discover a perfect blending of science and art, so combined that it is impossible to say where the one ends and the other begins. Where these are divorced there can be no true architecture. A steel-constructed building, for instance, cased with terra-cotta—or any other material for the matter of that—is not architecture at all.

In studying a building this is the first test to be applied; this is the standard to which we must first submit it for judgment. Do not begin by sketching or noting merely surface decorations or artistic embellishments; rather take the details of construction as your starting-point.

Note the size and bedding of the stones and the position of the joints—elements of beauty which are too often overlooked. Examine the methods of support and resistance, not thinking only of what is necessary, but also how it satisfies the eye. Discover the scientific and mathematical problems which have been successfully worked out. Yet do not even in thought separate the science and the art of the building—the two are conjoined, and must be studied together and simultaneously. The building must be solid and strong as well as graceful and pleasing. Stability is demanded no less than beauty. In fact, good construction, including the right use of materials, is a prime essential and the foundation of all excellence in architecture.

Nowhere, I think, is this more forcibly demonstrated than in the career and work of Sir Christopher Wren, who, both by education and the bent of his youthful genius, seems rather to have been of the scientific and mathematical than of the artistic order of mind. Though, like all educated men of his day, he took an intelligent and cultured interest in architecture, he received no special training for such work.

It is interesting to speculate what it was that finally drew all his wonderful gifts and powers into the service of architecture. Whether the determining impulse came from within or without—probably a bit of each—I cannot doubt that it was the scientific or constructive side of architecture that attracted him in the first instance, and that led him to accept an appointment as Assistant Surveyor-General of His Majesty's Works.

In our own experience we find cases where we are more impresed by the constructive beauty of a building than by any other feature in it. So there is an order of mind to which power and fitness of purpose appeal with unusual force, just as, again, a mathematical mind finds a fascination in the treatment of solids and voids and of superincumbent masses.

In conclusion I will briefly recapitulate some of these points. That which I have especially endeavoured to impress upon my brother students this evening is, that in addition to the ordinary architectural curriculum there must be a systematic and continuous study of buildings that are worthy, both ancient and modern. We must live in an atmosphere of art, breathe it in at the very pores of our skin, as the phrase goes, that it may act upon our own mental soil and render it productive.

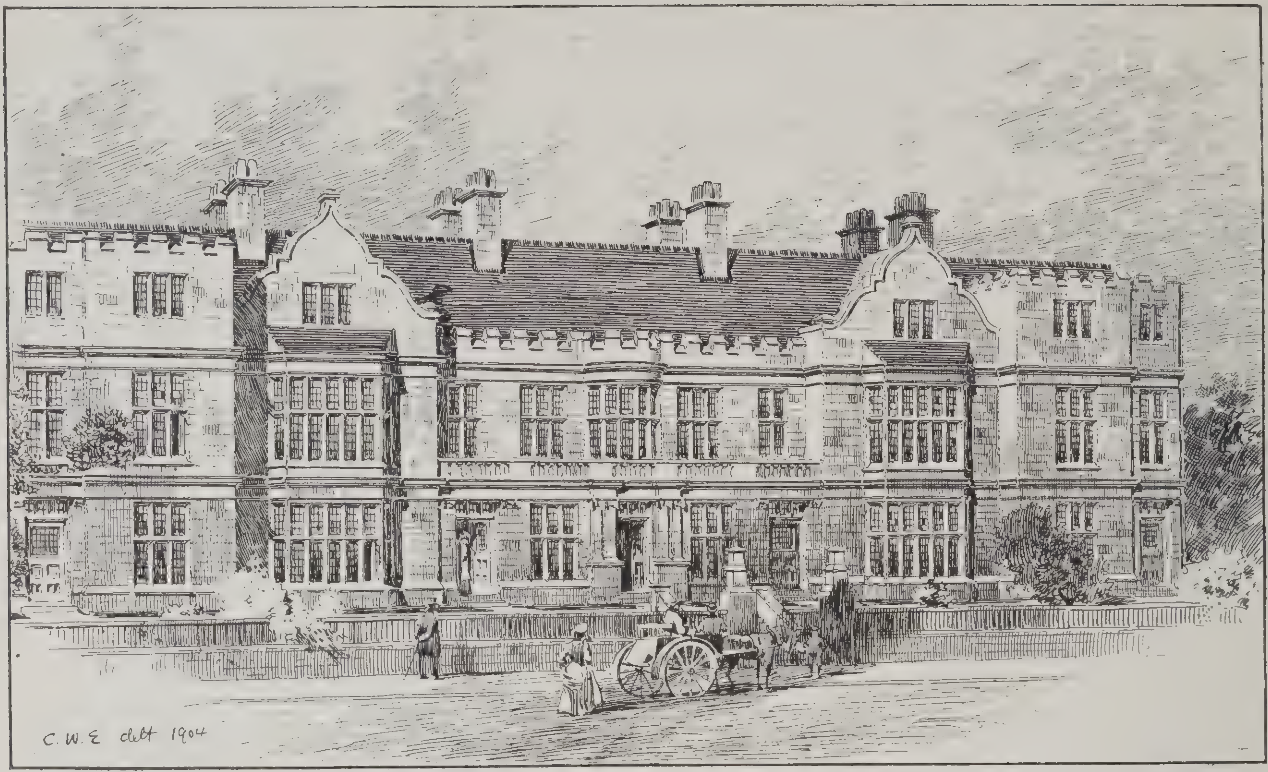
I have also urged upon you the importance of laying a good foundation in a practical knowledge of the art of construction and the right use of materials. This is the only solid, reliable basis for our art. Without such knowledge the keenest appreciation of the beautiful may be only thrown away; at the very best it is for ever fretting against the limitations and restrictions with which it finds itself encompassed. But if the practical, scientific foundation is well and truly laid, how great, how delightful, the field that opens up before the artist! His very fetters become his servants; the goad of a taskmaster becomes in his hand a tool for the accomplishment of all, and more than all, that his eye had conceived or his fancy dreamed of.

Let our ultimate ideal be the realization of those moral principles which are the dignity and power of architecture as they are of life—viz., simplicity and self-restraint, sincerity and directness of purpose. Without these we cannot but fail; with these we may accomplish something worthy of our art, and leave behind us work that shall be honourably characteristic of our time.

Mr. A. N. Prentice, in his criticism of the works submitted for the prizes and studentships, said:—I have always considered that a facility to draw well is the first makings of a great architect. Did not Michael Angelo impress on his pupils the importance of continually drawing? I know good drawing is not deemed of any great importance amongst some architects, but a visit to the gallery of the Alpine Club is sufficient testimony that our students think otherwise.

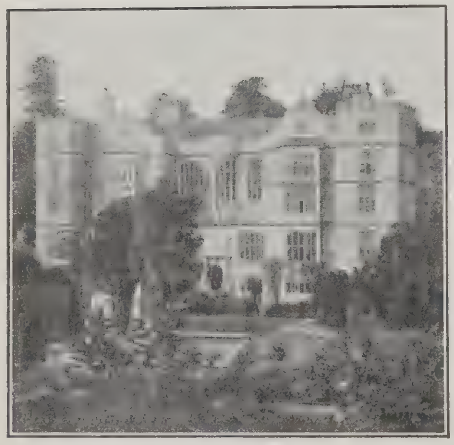
The designs this year for the Soane Medallion are of an exceptionally high order. Mr. Robert Atkinson, who receives the Tite prize, gives us an architectural fancy of great merit. Mr. James A. M. Hunter gains the Grissell Gold Medal with a design somewhat wanting in elegance and lightness.

A vote of thanks was passed to Mr. Belcher and Mr. Prentice on the motion of Professor Beresford Pite, seconded by Prof. W. R. Lethaby. The presentation of prizes was then made by the president.



The special interest in this building lies in the fact that the architect was instructed to produce a design after the model of Fountains Hall, a photograph of which is here given in order that a comparison may be made between the two.

TUDOR TERRACE, SEATON CAREW, WEST HARTLEPOOL. HARRY BARNES, A.R.I.B.A., ARCHITECT.



FOUNTAINS HALL.

WOLVERHAMPTON AND DISTRICT ARCHITECTURAL ASSOCIATION.

IN the course of his recent presidential address to this Association, Mr. Fred T. Beck said they should strive for the following principles:—

(1) That all works of a monumental character or national importance should be open for competition to all architects in the Kingdom on fair and reasonable terms and conditions.

(2) That all works under the jurisdiction of county authorities should be either competed for by those practising within the county or generally divided among them, as occasion arose.

(3) That works under municipalities should be given out in a similar manner among architects practising in such municipalities.

(4) That all salaried officials should confine their attention to works for which they were specially trained, and in no case to the carrying out of new buildings or extensions to existing buildings, but only to such alterations as might not involve enlargement, and, in the case of borough engineers, to street and drainage works pure and simple, including of course advising the council on plans submitted for their approval. Also, that a limit should be placed on the number of their staff—where engaged—according to the size and importance of the municipality.

(5) That in all cases where professional men were engaged the usual terms of payment should be observable in all respects, whether it was necessary for them to work in conjunction with the salaried official or not.

(6) That salaried officials should be allowed the privileges of taking pupils under certain restrictions and limitations.

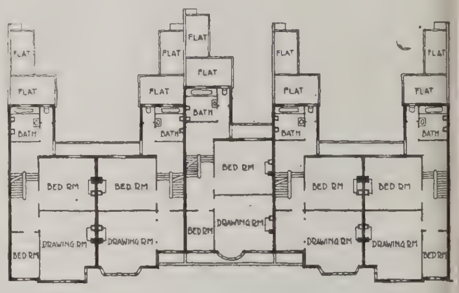
INSTITUTE OF SANITARY ENGINEERS.

BY-LAWS under the Public Health Act of 1875 formed the subject of Mr. J. A. Crowther's (A.M.I.C.E.) presidential address to the Institute of Sanitary Engineers last week. These, he said, were designed to supplement and not to supersede the express provisions of the Statute law. In the Act and in the incorporated clauses the subject of by-laws might sometimes appear identical with those of specific enactments, but in all such cases a closer examination would show that the subjects were not really identical. A by-law was not unreasonable merely because the local authority had no power of dispensing with its application in any particular case. (See *Salt* v. *Scott Hall*, 1903, 67 J.P. 306, and *Pomeroy* v. *The Malvern Urban District Council*, 1903, 67 J.P. 375—which cases were given in full at the end of the president's address.)

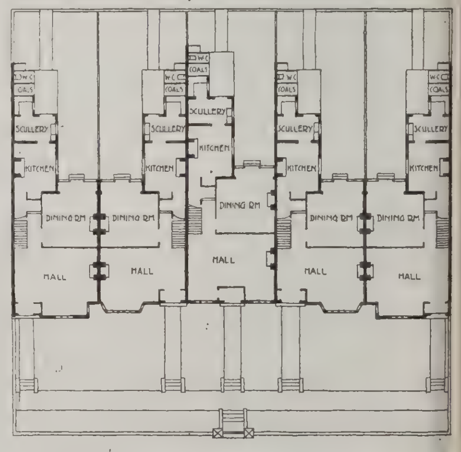
Of course, there were exceptional circumstances all over the country, and it was exceedingly difficult, if not impossible, to draw up a set of by-laws applicable to all parts.

Mr. Crowther instanced Southampton as situated on a peninsula between the Rivers Itchen and Test. The portion of the down immediately adjoining these rivers rested on a bed of mud or silt from 30ft. to 40ft. thick. It was impossible to construct substantial buildings of brick or stone without having the foundation properly piled, which, of course, meant that a considerable amount of floor-space was necessary in order to draw out the lines of the intended structure. It was proposed to exempt such buildings from the by-law requiring them to be built of brick, stone, &c., &c. But no; the powers that were would not allow it.

Their association should assist in trying to form a comprehensive set of by-laws, with the necessary exceptions for the whole country, and in obtaining, in conjunction with other societies, some method of protection for sanitary engineers while carrying out their work in the interests of the public.



1ST FLOOR PLAN ·



· GROUND FLOOR PLAN ·

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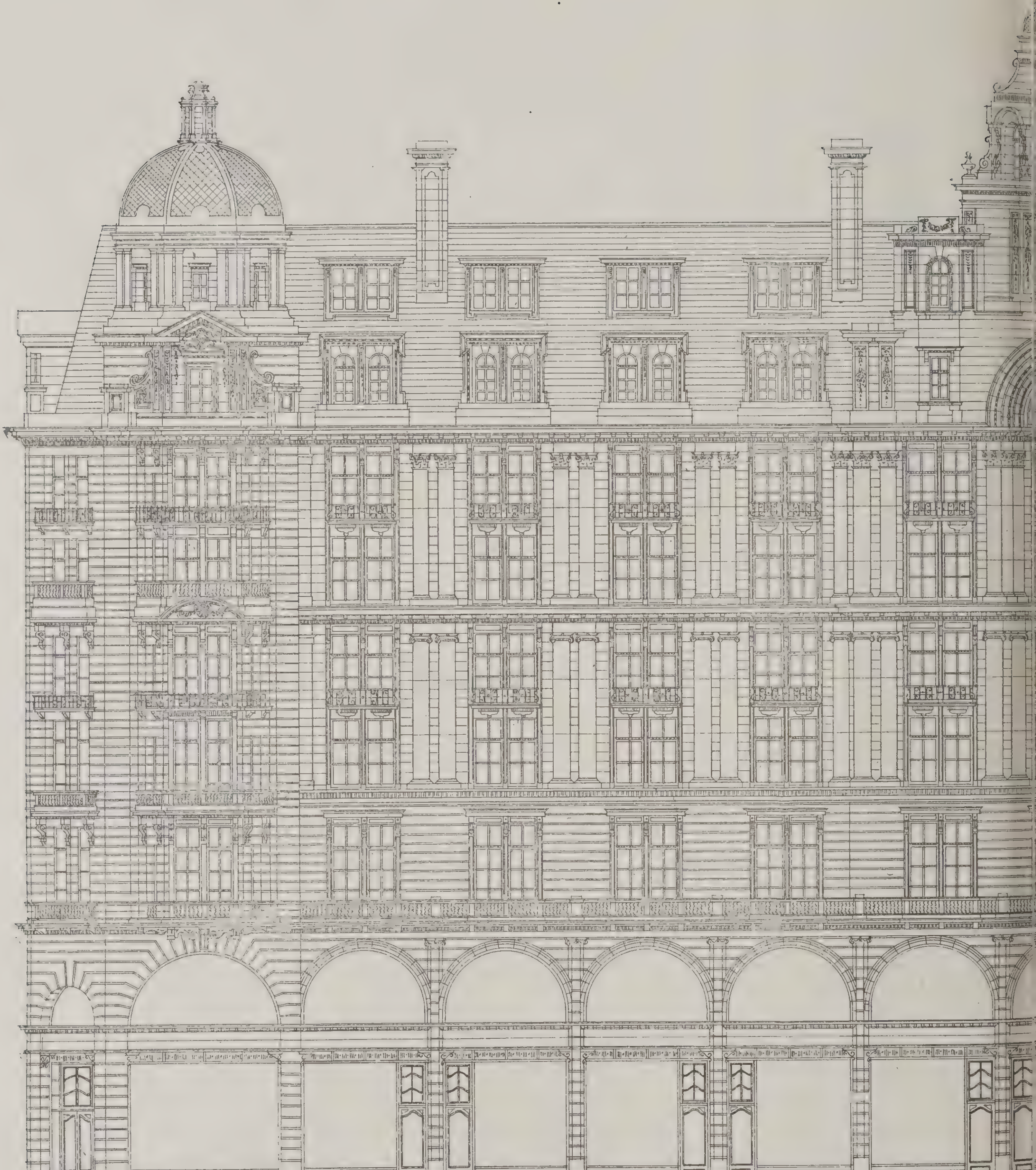
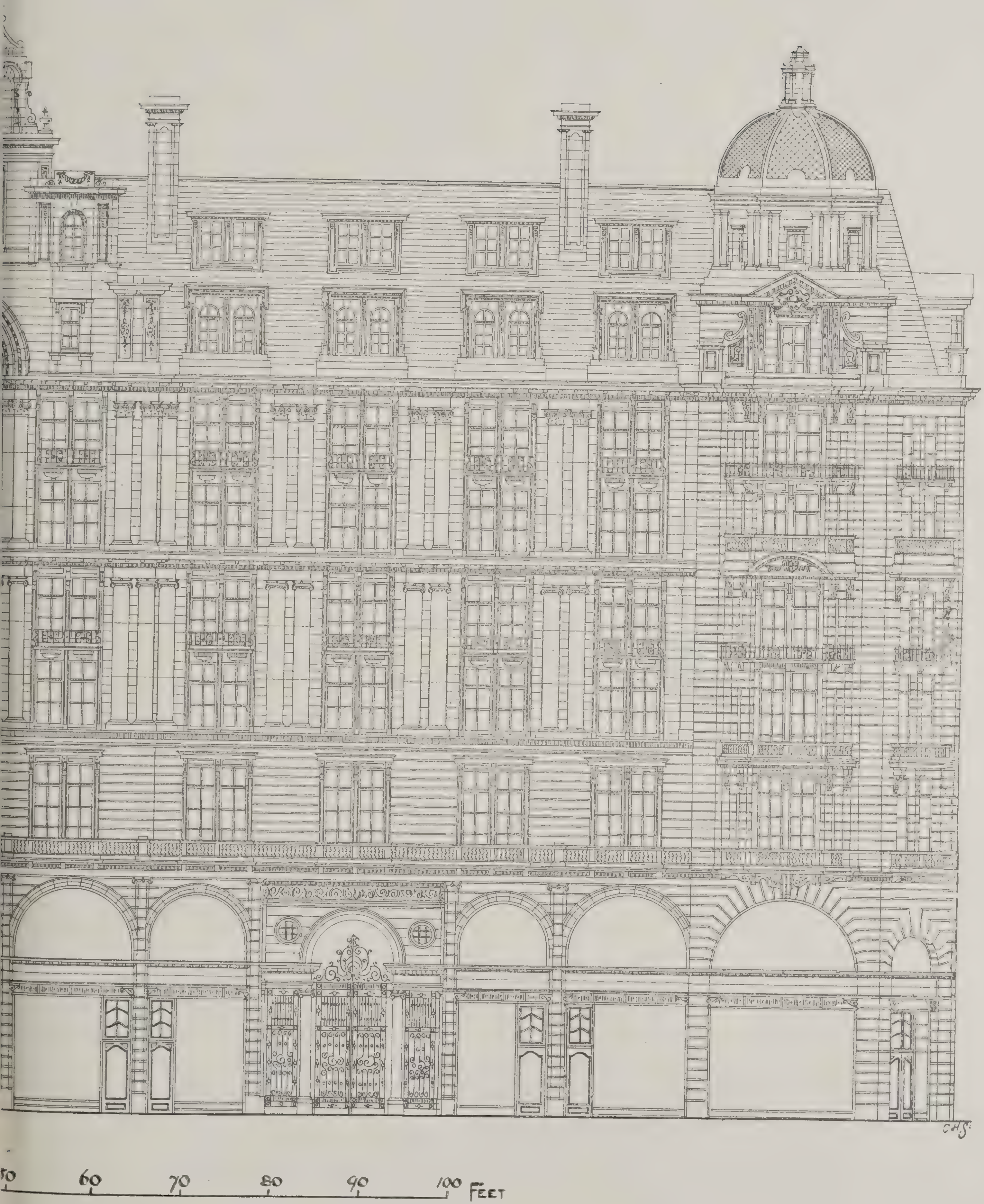
Supplement to
The Builders' Journal and Architectural Record,
Wednesday, February 8th, 1905.



THE PICCADILLY HOTEL, LONDON: ELEVATION TO PICCADILLY.



OODWARD AND WALTER EMDEN, JOINT ARCHITECTS.

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Correspondence.

Architects’ Fees and Building Estates: Fryer (Palgrave & Co.) v. Flood & Sons.

To the Editor of THE BUILDERS’ JOURNAL.

LONDON.

SIR,—As I am sure this case, decided in the Court of Appeal on January 26th, cannot be ully appreciated by architects and surveyors, desire to set forth the facts in your columns, as from the expressions of surprise I heard rom several architects present in Court, I am convinced that the decision arrived at both by Mr. Justice Ridley and subsequently confirmed by the Court of Appeal is news of some importance to the profession, openng up an entirely new contingency amongst hose dealing with properties for development. To put it shortly, an architect (as distinguished from an estate agent) cannot ecover a fee or commission from a vendor—even though he has agreed in writing to pay t—when the architect (or surveyor) has inroduced a buyer ready and willing to purchase, or in fact does purchase, a property hrough the introduction of the architect, although the purchaser pay no fee or remuneration whatever for such introduction so that there is no question as to receiving commission on both sides, much less a secret one, to the detriment of the purchaser) even hough the would-be purchaser is agreeable and is aware a commission will be paid by he vendor to the architect for such sale, if—and here is the point –the purchaser has a verbal or written arrangement to employ the architect to develop the property so purchased and pays him strictly architects’ fees accordng to scale for purely architects’ work. He hen becomes the “client”in prospective.

It may be that, as in my case, there was no agreement in writing to employ the architect hereafter on completion of the purchase, so that should the purchaser die or in any way be unable to proceed with he development the architect gets nothing or his services for bringing about the sale of the property and putting a large profit in he pockets of the vendors.

In justice to the defendants I should say at once that the point of law propounded by the Court was not relied upon—or, indeed, put forward—by them in their defence to he action, but they relied upon the non-ulfilment of the contract note, which was as ollows:—

Frognal Hall and Priory Lodge.

Dear Sirs,

We shall not depart from what we said at our interview, namely, that if a contract is entered into with Mr. Mossop and a deposit of not less than £3,500 paid us we will then pay you £500, nothing otherwise. All hinges n our approval of the plan of development, and the sooner you send us this the sooner draft contract can go to your client.

Yours faithfully,
(Signed) FLOOD & SONS.

My case was this. My firm was asked by he defendants to find a purchaser for their state. After negotiations they finally agreed o accept £35,000 and to leave a portion of he money by way of mortgage, always provided they approved the plan of development and financial arrangements. It was herefore necessary for us to make preliminary plans for properties which were estimated to cost upwards of £200,000 at our own risk in case of non-approval by the vendors.

The basis of the contract was previously et out in correspondence between my firm and the defendants prior to the drawings being commenced, as we anticipated that after seeing our plans and ascertaining hereby what profit could be made by the development the owners might change their minds and want more cash. And this is just what happened.

The plans were prepared and duly approved by the vendors. At the same time we produced to them an arrangement in writing from a well-known insurance company to acquire the freehold ground rents as the estate was developed on our plans for £92,000, which they—the vendors—confirmed, as they had stipulated to do in the terms of sale.

Subsequently we approached a gentleman known to us—a solicitor dealing largely in properties—who agreed to buy the estate for £35,000 on the terms previously agreed between my firm and the defendants, and of course subject to the agreement as to the purchase of the ground rents being vested in him. This gentleman we introduced to the vendors as the proposed purchaser and, being accepted by them—they having approved the plans and arrangements for development—sent in the contract for purchase. This, however, was never signed by the vendors, but subsequently withdrawn by them without notice, although the would-be buyer was ready and willing to complete, as stated in evidence. I, therefore, having completed my part of the bargain and put the vendors into possession of my scheme, which showed where and how the profits could be made, claimed to be entitled to my commission whether they signed the contract or not.

Proceedings were subsequently taken by me for the recovery of the £500 commission, or as an alternative for “quantum meruit” or damages for preventing me earning the commission. The case was withdrawn from the jury by Mr. Justice Ridley on the ground that I, as an architect, could not recover this commission against the interest of the “client” and public policy.

The evidence of my principal witness, *i.e.*, the so-called “client” who was buying, was interesting as showing that he had no objection to my receiving the commission (as he was paying me nothing for introducing the business) and concluded from the first I was the “agent of the vendors,” and that he “did not consider himself the client of anybody.” Surely he ought to know.

Some architects deal with properties so often that I desire to point out that, notwithstanding they may have an agreement in writing with the vendor to pay fees for the sale brought about through their instrumentality, they cannot recover them, even with the knowledge and consent of the party buying who has not paid or agreed to pay any fee or reward for the architect so introducing the property, if it is proposed he subsequently acts for the purchaser and so becomes the “client.”

I do not recollect having heard of a similar case and am curious to know whether architects in future are to include in their fees of 5 per cent. the sale of building estates or contract themselves out of the law.—Yours truly,

CYRIL F. FRYER.
(PALGRAVE & Co.)

28, Victoria Street, S.W.

A Defence of the Buttress.

To the Editor of THE BUILDERS’ JOURNAL.

SIR,—Independent of style, architecture is indebted to the maturing by time for its greatest charm. It has often been rightly urged that no building can be fairly judged until ten or twenty years have wrought their effect on it. And for many it is only this softening by time which is the attractive element in architecture. To them all styles are alike; and the Tudor building, if it be well stained by storm, will have more effect on them than the purity of Salisbury. What they love is soot and rainwater judiciously applied. In contemplating the halls of the fifteenth and sixteenth centuries, with their long flanks of shallow bays, each with the typical window of the period, it is not so much Perpendicular work we are admiring as the general “scenic” effect. Such bays are formed by the buttresses projecting from the flank wall between each window. Structurally there to take a thrust, they have subsequently played an important part in mellowing the building. It is to them that we owe all that delicate shading by wind and rain which, unimpeded by such shields for breaking up the elements, would have swept the surface with one even tone. And so one has not summed up the buttress by saying it is there to receive thrusts. Without going so far as to advocate their use where structurally unnecessary, a little more latitude might be given when it is remembered that the tone of the wall will be affected. Architectural criticism has hitherto considered only the one point; but it should be remembered that what we are to-day questioning as to its utility will one day be forgotten in the contemplation of the whole, under that light and shade it has been so largely instrumental in producing.

Gothic architecture would not exist without the buttress; the system is based upon it. And it may often be difficult to decide whether so essential a feature is or is not absolutely necessary. Must everything be calculated to the last degree of probability? Cannot there be “factors of safety” even in buttresses? It is not unreasonable to expect some attention to be given to what effect Time will have on a building. Mere durability is taken into account; why not the ultimate face it will show? Why should all be left to Time without any co-operation from the architect?

To a certain extent the buttress, especially on a long flank, occupies a corresponding place to the column in classic architecture, and the shadows should, of course, be considered in designing each.—Yours truly,

MAX JUDGE.

7, Pall Mall, S.W.

[Our critical note last week on the use of buttresses was addressed to the practising architect, who must look at the question of design with a very different eye to the public, by whom the finished result is called attractive, delicate and other superlatives, because it is captivated with the effects of weather: the “soot and rainwater judiciously applied.” Criticism of architectural design is a difficult matter, requiring considerable technical knowledge in the critic and careful analysis; the personal taste (the product of so many wayward influences) of the public, the antiquarians, painters and others is of no value. The “attractive elements” in old buildings referred to by Mr. Judge were not intentionally produced by their designers. The buttress was used by the Gothic builders for reasons of constructive necessity. To many persons a piece of plain wall surface is just as “attractive” as if it were all broken up in the modern way traceable to nonsense about the “tone of the wall.” It is of course conceivable that in a monumental building the adequate expression of the functions may require some such expedient, but to imitate the buttress form which has been the outcome of resistance to thrust is bad art. Mr. Judge seems to confuse a buttress with a pier.—ED B. J.]

The Carpenters’ Company: Judges for Woodwork and Woodcarving.—The following have consented to act as judges in connection with the exhibition of works in wood and woodcarving to be held at Carpenters’ Hall in June next under the joint auspices of the Carpenters’ and Joiners’ Companies:—Mr. John Willson, J.P.; Mr. John Belcher, A.R.A. (president R.I.B.A.); Sir G. L. Molesworth, K.C.I.E. (president Institution of Civil Engineers); Sir Aston Webb, R.A., F.R.I.B.A.; Mr. George Frampton, R.A.; Mr. W. Goscombe John, A.R.A.; Mr. E. Guy Dawber, F.R.I.B.A. (president Architectural Association); Mr. E. Roscoe Mullins; the president of the Institute of Builders, and the president of the London Master-Builders’ Association.

VENTILATION.*

The Advantages and Limits of "Natural" and "Mechanical" Systems Compared.

By J. D. SUTCLIFFE.

THE science of ventilation is a big subject, and no system is suitable for all buildings and every circumstance. It is a pity that in recent discussions real issues have been kept back by those commercially interested in some particular system, who have strung perverted quotations together to prove their own case or to damage other systems. As a case in point, no doubt many of you have received a little blue book purporting to be a report on the House of Commons' ventilation in which it is sought to prove that a Committee of the House of Commons decided against mechanical ventilation, whereas their recommendations were (1) to increase the size of the fan propelling fresh air into the House, and (2) to fix fans for exhausting the air, instead of heated upcast shafts, which had been in use up to that time.

Holding no brief for either the "mechanical" or "natural" systems, I propose to place before you the advantages and limitations of both so far as my experience and practice will allow.

Ventilation Defined.

Ventilation has been variously defined, but I take it that all reasonable men are agreed that it is the passing into and through a room of sufficient fresh air to keep the air in that room reasonably pure and fit for use. Fortunately, in judging the purity of air breathed in rooms it is not necessary to determine more than the amount of CO_2 present, as this forms a sufficient indication of its quality.

How to test Air for Purity.

In 1802 Dalton devised a method which, improved later by Pettenkoffer, is still in use by chemists for exact determinations. To those who have no chemical knowledge I can recommend the apparatus illustrated in Fig. 1.

Each of the tubes shown contains an equal amount of a weak solution of baryta and alkali, coloured pink with the indicator phenol-phthaleine, and as the acid in the air acts on the baryta and neutralizes it the pink colour gradually disappears. In using the apparatus, one of the tubes is connected to the can filled with water, and by an arrangement of piping the water is drawn off, causing the air by which it is displaced to pass through the solution, the amount of air passed through being measured by the amount of water run off.

This is done inside the room tested and also outside in the free atmosphere, and it can readily be seen that if it requires only one-third as much air to decolorize the solution inside the room as outside, the air in the room must contain three times the impurity present in normal air.

Standards of Efficient Ventilation.

In specifying satisfactory ventilation it is not enough to merely prescribe a certain air-space per person, though this is good, or even to fix a certain supply or renewal of air per person, though this is better, but in all cases a standard of CO_2 should be definitely fixed. In schools a cubic space of 120ft. per child is deemed sufficient by our educational authorities, who do not realize that the place for children is in the open air; and if this is not possible then they should have the nearest approach to it that can be given. In factories the minimum space for each worker varies from 250 to 500 cub. ft., according to the healthiness or otherwise of the trade. All authorities are agreed that 3,000 cub. ft. of fresh air per hour is necessary for a man if he is to breathe reasonably pure air. The standard in the Massachusetts and most American schools is 2,000ft., whilst in our own schools we have no standard whatever.

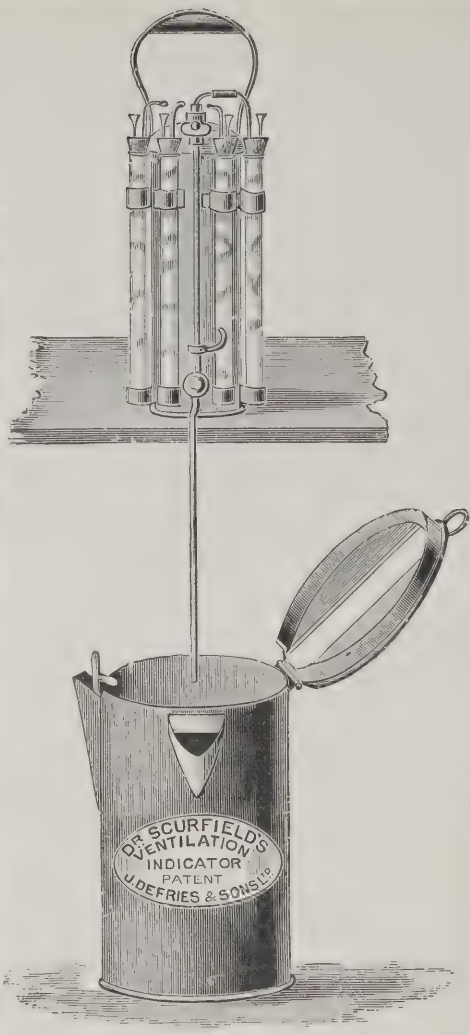

FIG. 1.—DR. SCURFIELD'S AIR-TESTING APPARATUS.

Now with regard to the standard of purity which ought to be maintained. In cotton cloth factories where artificial humidity is used the CO_2 must be kept down to below 9 parts in 10,000 parts of air, and so far as I know these factories are the only buildings in the United Kingdom compelled by law to ventilate to a definite standard of purity. My own idea is that the ventilating engineer should aim at a standard of 5 or 6 parts of CO_2 under normal conditions and 9 parts of CO_2 as a maximum under any circumstances.

There is not the least difficulty in keeping the CO_2 in any room down to below the standard required by the cotton cloth factory Act. This is shown clearly by the report of Mr. Scudder, the chemist who was recently requested by a committee of employers and employees to take samples of air from thirty different factories. In all Mr. Scudder took 287 samples and found that only five exceeded the amount allowed by the Act. Further proof is given on p. 161 of the chief factory inspector's report for 1903, where the results of more than fifty different tests are given. Some are as low as 4·6 parts of CO_2, the majority between 6 and 8 parts, and only nine above the standard allowed.

It seems somewhat hard on cotton cloth factory owners to be compelled to keep the CO_2 down to 9 parts in 10,000 of air, when it is safe to say there are very few schools in England (certainly not 5 per cent.) that would pass the same test two hours after lessons had commenced and there are many schools where the CO_2 reaches 18 or 20 parts per 10,000 before the end of the afternoon. The nose is usually an excellent guide to the presence of impure air, as when anybody fresh from the outside enters a room a faint smell is perceived if the air contains 7 parts of CO_2 per 10,000, and when it reaches 8 or 9 parts we usually say the room is "close."

Natural or Automatic Ventilation.

"Natural" ventilation is not the correct term to use in the sense that it is used to-day by all the makers of cowls who arrogate to their own particular system the word "natural." A much better term is "automatic" ventilation, to distinguish it from "mechanical" or "fan" ventilation. My idea is that the only "natural" ventilation is outside a building in the fresh sunlit air of heaven.

The Song of the Open Window.

Of all kinds or systems of ventilation my preference is for the open window. Some of my hearers may say what has the science of ventilation to do with this, but the ventilating engineer, if he is wise, thinks a good deal of the open window, and in my opinion there is no system either automatic or mechanical to compare with it. I preach this gospel in season and out, and practice it with great benefit to myself and my family.

We have been told so frequently that if we sit in a draught we shall catch cold that we have come to believe it, whereas the true explanation of why we "take cold" is a very different matter. A cold is a germ disease, and the surest way to resist an attack is to be surrounded by pure air. I never catch a cold unless I am compelled to stay in a close and stuffy atmosphere, such as we sometimes get in a dining-car, where the windows are not allowed to be open, or in a crowded hall or theatre. When the vital forces are lowered by breathing impure air disease germs gain an advantage over otherwise healthy tissues and rapidly spread their baneful effects over the whole system, and this is how we catch "cold."

I am going to go further and say not only draughts are not dangerous but since they are inseparable from a constant and plentiful supply of fresh air they are to be cultivated. Look at the thousands of consumptives who are now living this open-air life. If anyone suffered from it surely these frail mortals would.

Automatic Ventilation.

Returning again to automatic ventilation, this can as a rule be very well applied to an ordinary house. Fig. 2 (next page) shows a ground plan of my house with the warming and ventilating arrangements clearly marked. There are two hot-water radiators fixed in the hall, one near to the inner door, and the other at the side of the staircase, while there

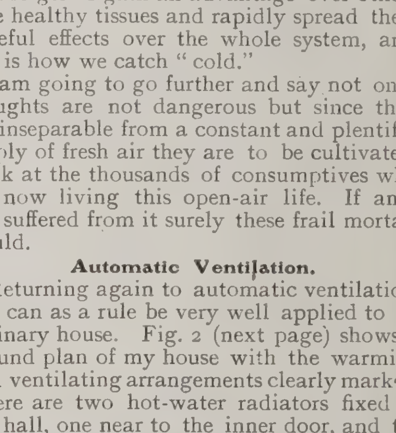

FIG. 3.—VENTILATING RADIATOR.

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* The greater part of a paper read before the Institution of Heating and Ventilating Engineers on January 17th, 1905.

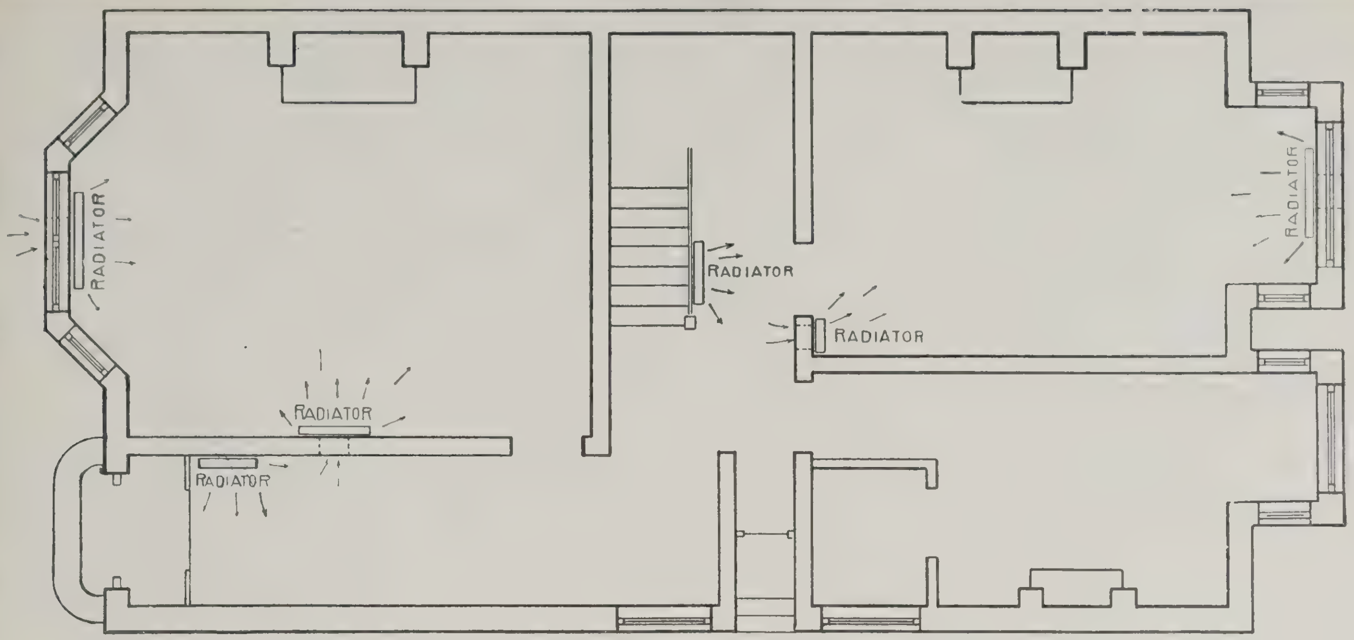


FIG. 2.—GROUND PLAN OF HOUSE WITH BEST POSITIONS OF RADIATORS.

are also radiators under each window and one in each room with their backs to the hall. The four radiators in the rooms are all of a ventilating pattern, as Fig. 3, the two under the windows having fresh air brought to them from the outside and the other two from the hall, where it is always fresh and pleasant. I have also fixed an outlet near the ceiling, and this is an excellent plan of taking off the products of combustion from the burning gas.

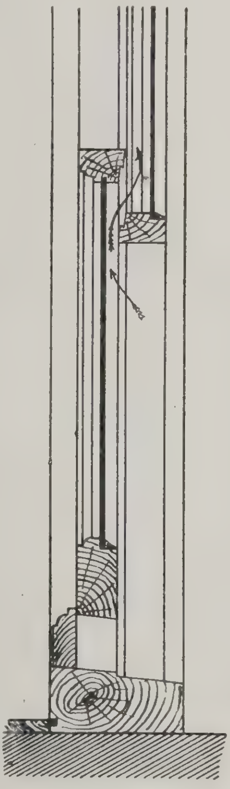


FIG. 5.—WINDOW AIR INLET.

Air Inlets.

I am not greatly in favour of the ordinary Tobin tube. It is unsightly, and if of sufficient length to be of any use it is difficult to keep clean. I much prefer air-inlets of the type shown in Fig. 4 below). If these are fixed about 6ft. 6ins. from the floor they answer their purpose well.

Window Inlet Ventilation.

Better than these, however, is the window inlet shown in Fig. 5. A piece of wood, say 3ins. deep and the width of the window, is fixed opposite the bottom rail of the sash. Then the bottom sash is raised to the height of the inserted piece of wood and air enters the room at the meeting bars in the direction shown by the arrows, and a very efficient inlet is at once provided. Whatever is claimed for the ordinary Tobin tube may be reasonably claimed for this simple window inlet.

Window Outlet Ventilation.

I should like to mention here a point in the construction of windows that I think is worth attention. All windows should be carried up to the ceiling level, so that when they are opened at the top the heated and vitiated air of the room will have a much better chance of escape than if the top of the windows were 18ins. or 2ft. below the ceiling.

Schools or Other One-storey Buildings.

Schools or similar buildings of reasonable size and width can be very well ventilated by automatic appliances, but to ensure a thoroughly satisfactory system of automatic ventilation the school should be only one storey high and not more than 30ft. wide. The warming and ventilation should be combined. The best plan is to use single-flue ventilating radiators fixed under each window, with fresh air admitted behind each radiator. If the weather is suitable the windows can be opened for additional air supply, and the only other thing necessary is a series of good-sized outlets at the ridge of the roof.

Air Outlets.

It is frequently claimed by manufacturers of patent cowls that their particular make will produce strong extraction currents of air in all weathers. This is a claim I have never been able to substantiate, and in my experience the best roof ventilator is the one which allows the air to pass out with the least obstruction and yet is weather-tight. Years ago I assisted in testing some large Archimedean screw ventilators on the roof of the Manchester Art Gallery. Some had rusted fast and would not revolve, while others whirled round merrily when any wind blew. We fixed anemometers under several and found that the ventilators which were stationary allowed more air to pass out than the revolving ones, and Mr. Allison, the late city surveyor, had them all fastened.

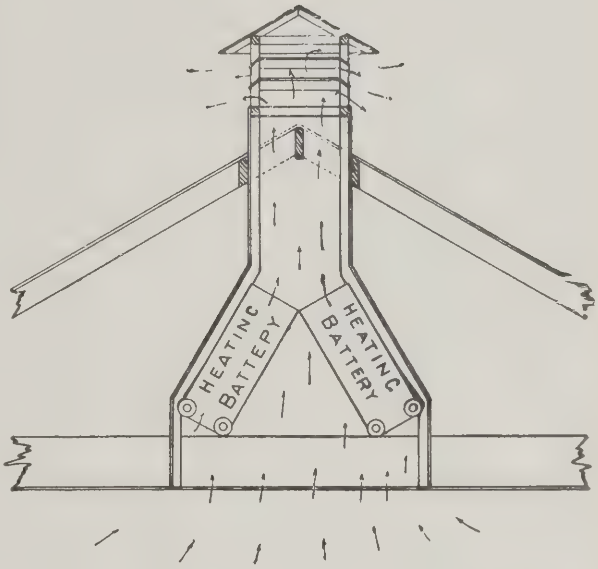


FIG. 6.—AIR OUTLET, WITH HEATING BATTERY.

If a really effective automatic extractor is wanted, heat will have to be used in one form or another. A good-sized Bunsen burner fixed just above the ceiling line in an outlet turret is a help, but a better arrangement is to use a special heating battery fixed as shown in Fig. 6. Such an outlet really gives extracting power, and with it there is no possible chance of a down-draught. I must warn you that it is not safe to heat such a battery from a hot-water supply on account of the considerable danger of freezing and bursting in frosty weather. Steam is the only suitable heating medium.

Hot-Water or Steam-Heating.

This brings me rather sharply to the question of the advantages and disadvantages of steam and hot water for heating purposes.

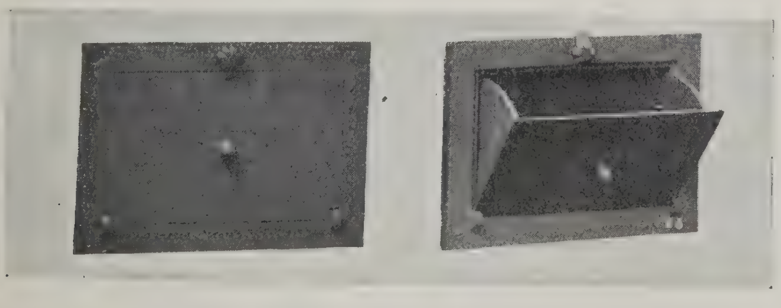


FIG. 4.—SIMPLE FORM OF AIR INLET.

Personally I prefer hot-water radiators for private houses, offices and other rooms that are not overcrowded but are usually occupied by the same number of people. With hot water, however, larger heating surfaces are required to get the same temperature effect, and also much larger pipes, while another disadvantage is that the heat is not so readily controllable. Using steam you will have useful heat from the radiators within an hour after lighting the boiler fire, whereas with hot water several hours usually elapse before any heat is available. There is also the corresponding drawback when you want to shut off the heat quickly. Directly the control valve is turned off the heat disappears when steam is used, but in a hot-water installation the heat remains a long time in the radiators and the overheating may become serious. Where at one time you have a building crowded out and at another time the same building less than half full, it is essential to use low-pressure steam, as it is so much more amenable, and you can raise or lower the temperature to suit the conditions in a few minutes. Then, again, in cold and frosty weather hot-water pipes are liable to burst if the apparatus is out of use for a few days, whereas with steam this cannot happen. One advantage of hot-water heating is that the temperature of the radiators or other heating surface is lower than with steam-heating, so that the air is not raised to such a high temperature, but with low-pressure steam-heating the difference is comparatively little. In no case do I recommend high-pressure steam-heating, and in my opinion 2 to 5 lbs. is quite as high as it is necessary or desirable to go.

Churches

are also buildings in which it is better to use a natural or automatic system rather than a mechanical or plenum system, and they can be warmed quite well on the lines laid down for small schools. The chief difficulty is the cooling of the air by the large windows and the roof, which causes considerable down-draughts. These can be avoided or minimized by using steam batteries in the roof outlets, as previously illustrated, and running one or two rows of small steam pipes round the church at the level of the eaves. If hot water is used for heating it is a very simple matter to use also a small separate steam boiler specially for the ventilation. What one should particularly avoid in the heating of a church are the usual channels sunk into the floor with steam pipes in them and gratings over. They are always foul receptacles for dust and dirt, and can never be properly cleaned.

I should have liked to have touched upon several other points in automatic ventilation, but will content myself by just a line in reference to the ventilation of

Lavatories and W.C.'s.

The usual plan of opening the windows and allowing the foul air to blow through the door and all over the house is not to be recommended. A better plan is to have an air inlet in the bottom rail of the door, or failing this to have the door shortened so that there is clear air-space under the door for its full width and 1½ins. deep. Then take the outlet through the wall at the highest point opposite the door. On the outside of the outlet have a protecting cover as shown in Fig. 7. Of course in a new building an outlet flue should be built in the wall and carried up to the roof.

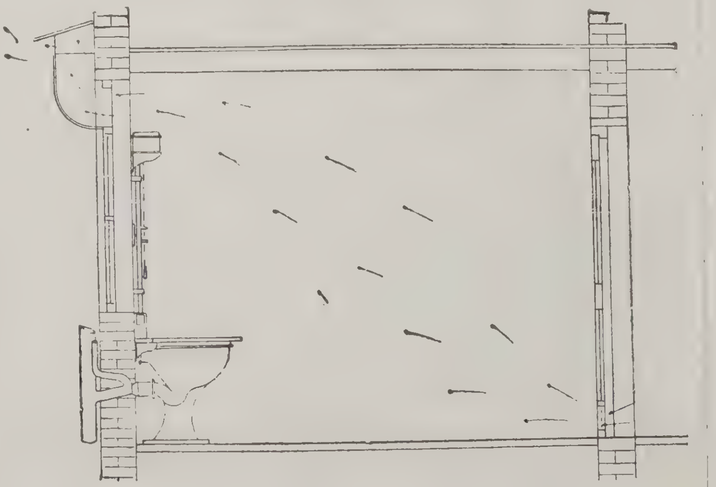


FIG. 7.—AIR INLET AND OUTLET FOR W.C.'S.

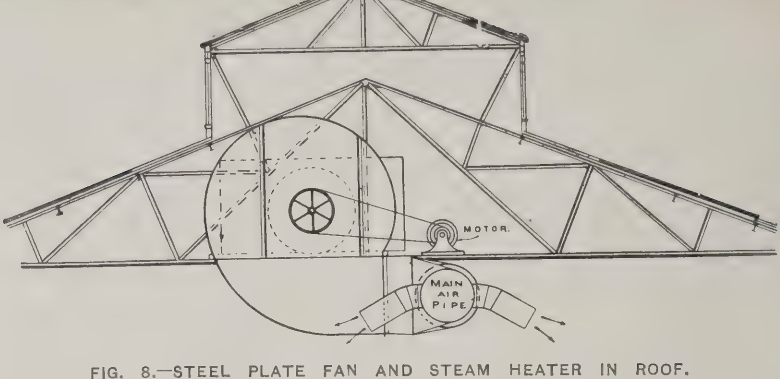


FIG. 8.—STEEL PLATE FAN AND STEAM HEATER IN ROOF.

Mechanical Ventilation.

Many of the difficulties that are met with in automatic ventilation disappear when fans are used. The necessary amount of air is obtained by simply choosing the right style and size of fan, and driving it at the proper speed. The only problem—a serious one, I grant—then lies in the correct distribution of the air.

Air-distributing.

The movements of air currents have not been sufficiently studied, and I think sometimes it is a misfortune they are not visible. If fresh air were coloured blue, and when it became foul it blushed a delicate pink, we should be able to deal with it better. I know a great many halls, schools and other rooms where there would be a good deal of blushing. At present, unfortunately, we know very little of the behaviour of air. The difficulty with all air currents is in controlling their direction. For instance, if you admit air into a room, say, on a side wall at 6ft. 8ins. from the floor, and direct it upwards to the ceiling, what happens? Well, that will depend on the temperature of the incoming air in relation to the air in the room, and will constantly alter as the temperature and velocity vary. If the air enters at considerably higher temperature than that in the room the warmer air will go to the ceiling and probably diffuse itself there, travelling along to the opposite wall and then cooling and coming down or passing out at any opening that may be provided. If the admitted air should be colder than that in the room it will probably never reach the ceiling, and will certainly not cross the room unless a fan pulls it, and even then it may travel along the floor. Of course, any intermediate stages of warmth will give intermediate stages of direction and velocity.

Velocity of Air Currents at Inlets.

The velocity of air coming into a room has a great deal to do with the comfort of the occupants. Ventilating engineers generally say that if the velocity does not exceed 5ft. per second there is no perceptible draught. This needs qualifying, as a great deal depends on the occupants. A thin spare man who takes little out-door exercise can feel a draught where a healthy man feels none, and until some device of enveloping each man in his own particular temperature and in his own pet air current is introduced it will be difficult to suit everybody. With all systems of automatic ventilation there is the difficulty of keeping the velocity of air constant. If a strong wind is blowing on one side of the building the air enters the inlets on that side much more rapidly than it does on the leeward side or on a still day.

I remember discussing some ventilating plans of a new technical school with an architect, who told me he had decided to adopt a certain scheme because the ducts and air-inlets were so much smaller than in any of the other plans. He instanced a room for twenty pupils with an inlet only 6ins. square and pointed to the difference between this and another plan where the inlet was 18ins. square for the same room. I told him that if 3,000 cub ft. of air per hour per pupil were supplied the velocity at the inlet would be 66·6ft. per second, whereas with 18ins. square it would only be 7·4ft. per second. On the other hand, if the velocity were to be kept down to 4ft. per second each poor pupil would only get 180 cub. ft. per hour, whilst with the larger inlet they would each get 1,620 cub. ft. per hour. Many ventilating contracts have no doubt been given out for similar reasons, but no architect is likely to make such a serious mistake more than once.

Engineering and Printing Works.

The modern engineering, printing and similar works are built, as a rule, only one storey high. They cover a great deal of ground, and it is not possible to keep the air fresh and sweet in the centre of the rooms with ordinary air inlets in the walls. Frequently there are travelling cranes overhead, and steam pipes and air ducts must be kept clear of these and can only run parallel with the cranes and not across their path.

In such cases it is necessary to fix any heating and ventilating plant well clear of the cranes, shafts and belts, and sometimes the fan and heating battery are placed in the roof as shown in Fig. 8, where they cannot cause any obstruction. More frequently, however, the fan and heater are fixed on the floor, and the distributing air ducts or pipes are carried in the most convenient positions for supplying the whole of the works with fresh air warmed to suit almost any conditions of temperature that may be required.

One incidental advantage of this system of heating is that when the works are being warmed up on a cold morning and before work is started the inlet for fresh air from the outside to the fan may be shut off, and the fan can draw its air actually from the rooms it is heating. This circulating of warm air greatly reduces the time taken to heat up the works to the required temperature.

(To be concluded.)

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Strength of Concrete Steel Lintel.

STUDIO writes: "A concrete lintel is composed of 1 part of best Portland cement, 2 of well-washed coarse sand and 3 parts of clean screened gravel and hardstone broken to pass a ¾in. ring; size 12ins. by 12½ins., 9ins. bearing at each end, and having three angle steels 2½ins. by 2ins. by $\frac{5}{16}$in. embedded 1ins. from underside and ends; span 9ft. 3ins. Would this be sufficient to carry a load of 11 tons distributed? A method of calcuating for armoured concrete lintels, &c., would be esteemed. Please name a good book on graphics and architectural ornament for a beginner."

No very precise estimate of the strength of concrete steel beams can be made. This is so even when the estimate is made by the ame person, while when done by different people the results are certain to vary coniderably. The section shown in Fig. 2 would probably be more suitable than that uggested by you, shown in Fig. 1. There re various formulæ which accord with the xperiments upon which they were based, ut they appear to be of little use for general work. We may take first

$$W = \frac{at^2}{L^2}\left(570 - 2500\frac{a}{t}\right) - \frac{t}{10},$$

here W = safe external load in cwts. per oot run, a = sectional area of steel reinorcement in square inches, t = thickness of oncrete above centre line of reinforcement, = span in feet. Then for section Fig. 2

$$= \frac{2{\cdot}38 \times 10{\cdot}283}{(9{\cdot}25)^2}\left(570 - 2500\frac{2{\cdot}38}{10{\cdot}283}\right) - \frac{10{\cdot}283}{10}$$

$= {\cdot}286(570 - 578{\cdot}62) - 1{\cdot}0283 = -2{\cdot}4653 -$ $0283 = -3{\cdot}4936$; but as the result is a minus uantity it has no meaning, and therefore e formula does not apply. By another rmula, condensed from the "Building ews" of June 24th, 1904, $M = \frac{1}{3}pa^2e + tsb$,

$$= \frac{20s}{e}\left(-1 + \sqrt{1 + \frac{s}{12eh}}\right),\ b = h - \tfrac{1}{6}h - a,$$

here M = bending moment in inch-lbs., a = e distance from neutral axis to most remote bre in compression, p = the unit compressive train on the concrete, say 500 lbs. per. sq. in., = the width of the beam, h = the height the beam, t = the unit tensile strain on e steel, say 16,000 lbs. per sq. in., s = the area of the steel, b = the distance from the neutral axis to the centre of action of the steel, which should be placed at five-sixths of the total depth. The neutral axis of the tee-section proposed will be as shown in Fig. 3, ·717 above base, and therefore $\frac{12}{6} - {\cdot}717 =$ 1·283in. above underside of concrete to give a depth of five-sixths to the centre of action. Then

$$a = \frac{20 \times 2 \times 1{\cdot}19}{12{\cdot}5}\left(-1 + \sqrt{1 + \frac{2 \times 1{\cdot}19}{12 \times 12{\cdot}5 \times 12}}\right)$$

$= 3{\cdot}80(-1 + \sqrt{1{\cdot}0013}) = 3{\cdot}8({\cdot}001) = {\cdot}0038$,

$b = 12 - \frac{12}{6} - a = 12 - 2 - {\cdot}0038 = 9{\cdot}9962$,

$M = \frac{1}{3} \times 500 \times a^2 \times 12{\cdot}5 + 16000(2 \times 1{\cdot}19)$

$b = {\cdot}0301 + 380655{\cdot}3$ and $M = \frac{wl}{8}$,

$$\therefore W = \frac{8M}{l} = \frac{8M}{111} = \frac{3045242{\cdot}4}{111}$$

= 27,435 lbs. = 12·25 tons safe load distributed. Although this appears satisfactory, it may be a pure accident, as the allowance of 500 lbs. per sq. in. for working stress in compression of concrete seems to the writer to be excessive—about four times greater than it ought to be. It would be equivalent to $\frac{500 \times 144}{2240} = 32{\cdot}143$ tons per sq. ft. The New York building regulations give the ultimate compressive strength of ordinary concrete as 350 lbs. per sq. in., and moreover the calculations show the distance from the neutral axis to the top of the beam as only ·0038in., which is inconceivable, so that this formula seems no better than the last. Wilkinson's formula for concrete-steel floors may be applied to this case as follows: $W = \frac{12t^2}{S^2}$, where S = span in feet, t = thickness in inches, W = safe load in cwts. per foot run. Assuming that the concrete is 4 to 1 Portland cement, except for the top inch, which is to be 2 to 1, and that the steel reinforcement is $\frac{1}{60}$ of the total area and placed in the lower half, then $W = \frac{12 \times 12^2}{9{\cdot}25^2}$ = 20 cwts. per foot run, $\frac{20}{20} \times 9{\cdot}25 = 9\frac{1}{4}$ tons safe load. But the total sectional area is 150 sq. ins., and one-sixtieth of this would be $\frac{150}{60} = 2{\cdot}5$ sq. ins., while the actual section of steel proposed is only $2 \times 1{\cdot}19 = 2{\cdot}38$ sq. ins., so that the section would be more in agreement if made $2\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{16}$. This formula does not profess to be more than a close approximation, and the safe load is still below the required amount of 11 tons. Without trying any more formulæ the writer would be content to use three $2 \times 1\frac{1}{2} \times \frac{5}{16}$ steel tees, as in Fig. 4, if the load is imposed by a brick wall. For a full study of the subject as at present known see Marsh's "Reinforced Concrete," 31s. 6d. nett. from these offices. The best book on graphics for a beginner is Hardy's "Graphic Statics" (3s. nett.); for architectural ornament see THE BUILDERS' JOURNAL Book List No. 2.

HENRY ADAMS.

Fig 1

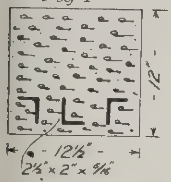
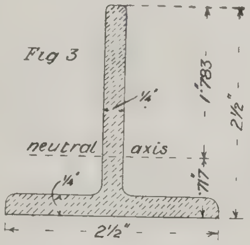


Fig 3



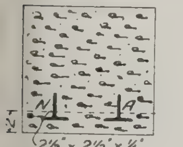


Fig 2

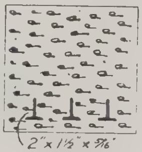


Fig 4

Gallery Cantilever.

CHELTENHAM.—J. J. L. O. writes: "The diagram (redrawn) represents a cantilever supporting seats in a gallery. What pressure do these loads cause upon column and wall respectively?"

In this case it is assumed that the loads given include an allowance for the weight of the structure, and the following analysis would then be sufficient to make the preliminary design from. For the projecting portion, 6 tons × 10ft. from support to centre of gravity of load = 60 ton-feet bending moment at supporting column, the intermediate ordinates being given as a parabola, as in Fig. 2. For the horizontal portion $\frac{wl}{8} = \frac{4 \times 10}{8} = 5$ ton-feet for the bending moment in centre due to direct load, but the upward pull from the cantilever will be very largely in excess of this, and will be shown by ordinates to the line joining the termination of the previous ordinates with the centre of bearing in wall, diminished by the parabola due to the downward action of direct load. The anchorage at the wall end must be sufficient to counteract an upward pull of $\frac{10\text{ft.} \times 6\text{ tons}}{11\text{ft.}} = 5{\cdot}\dot{4}\dot{5}$, say 5½ tons, and the column will have to support $6 + 4 + 5{\cdot}\dot{4}\dot{5} = 15{\cdot}\dot{4}\dot{5}$, say 15½ tons. The shear stress diagram will approximately be as shown in Fig. 3. At the column there will be a load of 6 tons supported on the one side and $9{\cdot}\dot{4}\dot{5}$ tons on the other. The 6 tons will be reduced uniformly to zero at the outer end, and the $9{\cdot}\dot{4}\dot{5}$ will be reduced uniformly at the same rate to $5{\cdot}\dot{4}\dot{5}$ tons at the anchorage.

HENRY ADAMS.

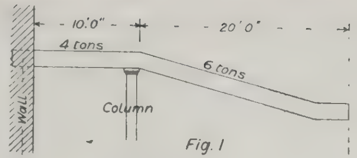


Fig. 1

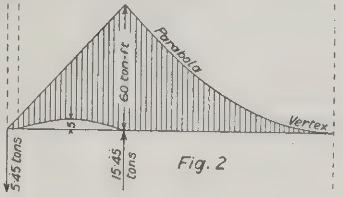


Fig. 2

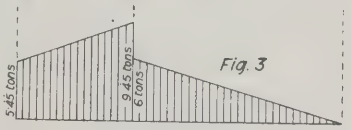


Fig. 3

Expenses in Connection with Sale of House.

EALING.—WORKS writes: "I have a house which I want to sell for £285, leasehold, ninety-six years unexpired. I have a building society mortgage for £225, of which £24 is paid off. What expenses should I be put to in the event of a sale?"

The stamp duty on such a conveyance would be 2s. 6d. for every £25 of the purchase money. The costs of vendor's solicitor would be 30s. per £100; making a total of 30s. for stamps and 90s. for costs. I think, however, that it is probable that you will find, on enquiry of the secretary of your building society, that they have a scale of fees which works out at less money than this.

F. S. I.

Dry-rot: Landlord and Tenant.

LIVERPOOL.—X. writes: "A client signed a lease of a house for a period of three years (ordinary wear and tear excepted). At the expiration of 2½ years dry-rot appeared in all the floors on the ground level. The tenant called upon the landlord to put the house in a habitable state. The landlord demurred at first but finally agreed, and the whole of the floors were taken up and renewed, extra ventilation, which was badly required, being provided. The landlord then sent the bill to the tenant for payment. The tenant took no notice of it, and now the landlord has sued him for payment in the county court. What is your opinion of the matter?"

The answer to this question depends in a very large degree upon the exact wording of the lease, but assuming the covenants are those usual in a lease for a period of three years, I am of opinion: (1) That the lessor (landlord) is under no obligation to repair at all (unless expressly undertaking to do so). (2) That the lessee (tenant) accepted the premises at the commencement of the term and cannot go behind that acceptance at any subsequent period. (3) That the fact that the repairs in question became necessary on account of decay and by reason of no act of the lessee makes no difference, he is liable to repair just the same, due regard being had to the age and character of the premises. (4) "The landlord demurred at first, but finally agreed." Of course I cannot tell quite what this means, and only examination of the correspondence can determine. It may be that the lessor has agreed to waive (to some extent at least) the repairing covenant of the lease, and it is just possible that this may help your client. A solicitor having all the documents before him could no doubt give an authoritative opinion. F. S. I.

Obituary.

Mr. G. Weller, builder, of Arundel, died on February 1st, aged 47.

Mr. Walter Aston, F.R.I.B.A., of Manchester, died recently, aged 44.

Mr. T. E. Morgan, builder and contractor, of Brecon, died recently, aged 55.

Mr. Thomas Bastiman, builder, of Middlesbrough, died recently from injuries sustained by falling into some excavations at Guisborough.

The late Mr. W. T. Richardson, of the firm of Mesrss. A. & W. Richardson, cement makers and brick merchants, Vauxhall, left estate of the gross value of £44,013.

Mr. A. L. Mitchell, builder, of Alloa, Edinburgh, died recently. Born in 1820, he began business sixty-two years ago as a joiner and builder, and built up a large and most successful business.

The late Mr. J. T. Wimperis, F.R.I.B.A., who died on December 21st, left estate which has been valued at £51,430. Amongst other bequests he left £1,000 to the R.I.B.A. for promoting the knowledge of architecture, and £50 to the Architects' Benevolent Fund.

Mr. James Barnet, a native of Arbroath, died in Sydney on December 10th last. He had been in Australia for fifty years, and was 77 years of age. He was Colonial architect for New South Wales from 1865 to 1890. Amongst the works carried out by him in Sydney were the general post office, the museum, customs house, public library, medical school, and land schools to the Sidney University.

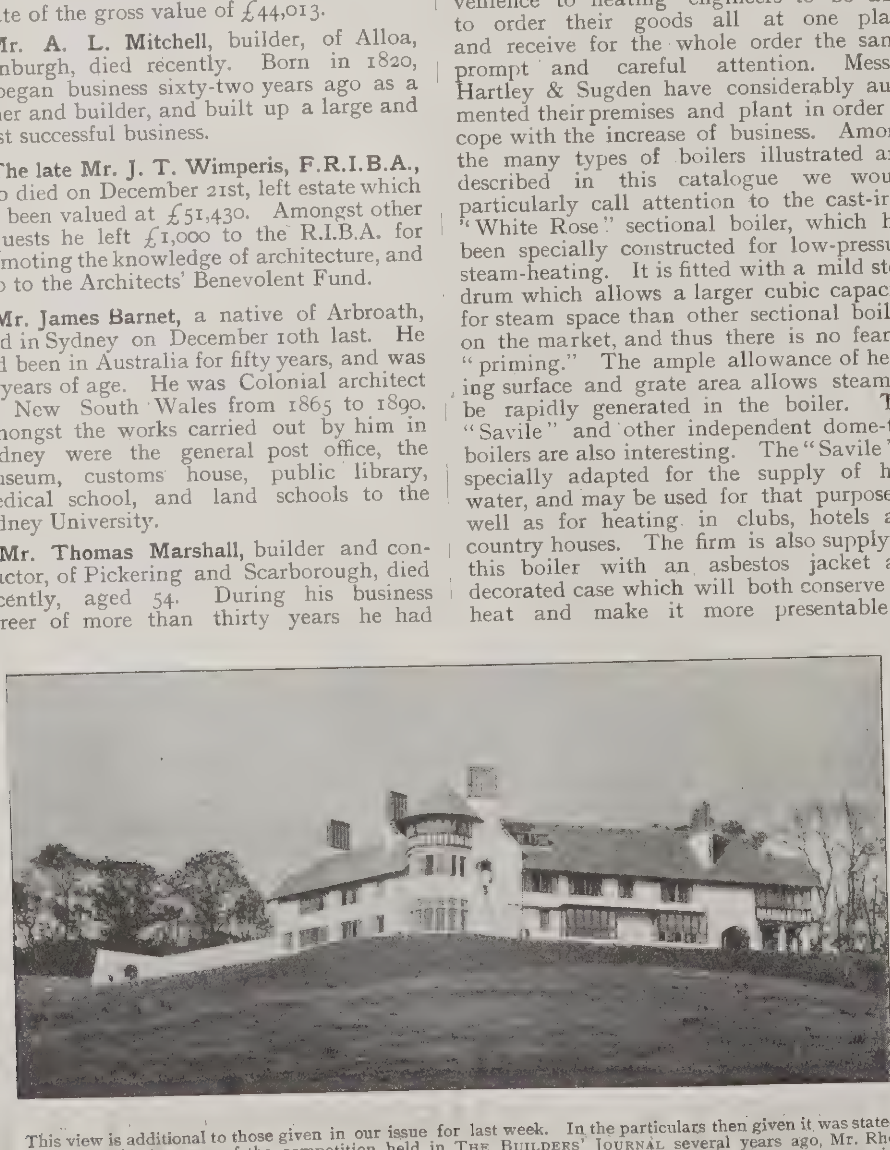
Mr. Thomas Marshall, builder and contractor, of Pickering and Scarborough, died recently, aged 54. During his business career of more than thirty years he had charge of many extensive contracts in the building trade in different parts of Yorkshire, and had done much in the building of house property at Scarborough. The firm of which he was the head is completing the new grammar school at Pickering for the governors of Lady Lumley's charity.

Mr. Richard L. Boulton, senior partner in the firm of Boulton & Sons, architectural sculptors, Cheltenham, died recently, aged 72. As a young man he executed a great deal of sculpture work for the cathedrals of Worcester, Hereford and Lichfield, under the direction of the late Sir Gilbert Scott, R.A., but for the past twelve years he had been living in retirement at Bournemouth. Among his last works were the statues on the high altar screen of Winchester Cathedral; also work at the Bombay Courts of Justice, Northampton Town Hall, and Keble College, Oxford.

Trade and Craft.

Boilers for Heating, &c.

Messrs. Hartley & Sugden, Ltd., who specialize in boilers, radiators, &c., for heating purposes, have just published a new catalogue which contains most useful notes and memoranda for heating engineers. This firm is, so far as we are aware, the first and only makers to supply both wrought-iron and welded heating-apparatus boilers, cast-iron sectional boilers and radiators. It is apparent that it is a great convenience to heating engineers to be able to order their goods all at one place and receive for the whole order the same prompt and careful attention. Messrs. Hartley & Sugden have considerably augmented their premises and plant in order to cope with the increase of business. Among the many types of boilers illustrated and described in this catalogue we would particularly call attention to the cast-iron "White Rose" sectional boiler, which has been specially constructed for low-pressure steam-heating. It is fitted with a mild steel drum which allows a larger cubic capacity for steam space than other sectional boilers on the market, and thus there is no fear of "priming." The ample allowance of heating surface and grate area allows steam to be rapidly generated in the boiler. The "Savile" and other independent dome-top boilers are also interesting. The "Savile" is specially adapted for the supply of hot-water, and may be used for that purpose as well as for heating in clubs, hotels and country houses. The firm is also supplying this boiler with an asbestos jacket and decorated case which will both conserve the heat and make it more presentable in appearance in such situations as passages or halls. The old lists of approximate heating powers we are glad to see discarded in this catalogue and lists of actual heating powers based upon careful observation in actual work substituted. It is calculated that 1 square foot of direct heating surface will heat with economy, under average conditions, 35ft. of 4in. pipe, and the flues in proportion. The address of Messrs. Hartley & Sugden is—Atlas Works, Halifax.



This view is additional to those given in our issue for last week. In the particulars then given it was stated that the design was the outcome of the competition held in THE BUILDERS' JOURNAL several years ago, Mr. Rhodes's design—which was highly commended by the Assessor—having been selected by the client at whose suggestion the competition was instituted.

THE GARDEN HOUSE SALTWOOD NEAR HYTHE. JOHN W. RHODES, ARCHITECT.

Keystones.

Mr. James Mansergh, F.R.S., past-president of the Institution of Civil Engineers, is lying seriously ill at Lancaster.

For the Restoration of Culross Abbey a fund is being raised. Mr. Carnegie has subscribed £100.

The Loanhead Board School, Kilmarnock, has been erected at a cost of £18,000 from designs by Mr. R. S. Ingram. Accommodation is provided for 1,150 scholars.

St. Mary's Church, Newton Abbot, is now being erected at an estimated cost of about £9,000 from designs by Mr. Edmund Sedding, of Plymouth and London.

Liverpool Cathedral.—The total sum now available for the main building is £146,918, and as the architect's estimate for this portion of the work is £277,000, the sum of £130,000 still has to be raised.

King's College Architectural Society.—A series of papers will be read before the society this term, to which all students and architects are invited. The first is for to-morrow, when Mr. M. Houghton will read a paper on "Christchurch Priory" at 5 p.m.

New Ball and Assembly Rooms at Norwich have been built on All Saints' Green. The ballroom is 70ft. by 40ft. and has a floor of maple wood laid on springs. Mr. J. Owen Bond, of Norwich, was the architect and Mr. J. Holmes the contractor.

Cheltenham Schools Competition.—In the recent open competition for new schools in Keynsham Road, Cheltenham, thirty-five sets of designs were received, and out of this number the designs of Messrs. Chatters & Smithson (Cheltenham), Messrs. Healing & Overbury (Cheltenham and Gloucester) and Mr. H. E. Lavender (Walsall) were reserved for final consideration, and the plans of Messrs. Chatters & Smithson ultimately accepted.

Salt-water Baths for Salford are propose to be erected at a cost of £20,000 on a sit facing Eccles New Road. There will be first-class swimming bath 65ft. by 25ft., second-class bath 75ft. by 32ft., with six first class and twelve second-class men an women's slipper baths. Provision will b made for a storage reservoir of salt wate not less than 100ft. in length by 40ft. i width and 10ft. in depth, the holding capacit being 250,000 gallons of sea water, which i to be pumped from a steamer.

Municipal Architecture.—In reply to th R.I.B.A. memorial regarding the practic of important architectural work being carrie out by borough surveyors and engineers, th Town Hall Committee of the Mancheste City Council state:—"(1) The architectura work of the Manchester Corporation is n placed in the hands of engineers or su veyors. (2) It has been deemed desirable t the Corporation to form an architectur department under the control of the ci architect, and that department carries o such architectural work as the Corporati from time to time orders. The suggesti of the Institute 'that the official in char shall be required to have obtained the qua fication of the Royal Institute of Briti Architects' has been complied with in t case of our city architect."

The Society of British Sculptors, of which e first statutory meeting will be held on onday next, aims at establishing a National allery of British Sculptures and attaining a oyal Charter.

Prof. Henry Adams, M.I.C.E., who ecently retired from the City of London ollege, has been appointed chief examiner building construction under the Board of ducation, South Kensington.

Stroud and District Master-Builders' Assoiation.—Mr. A. W. Hook (of Messrs. Wall Hook) has been elected president for this ear, in succession to Mr. W. F. Drew, of hatford.

The Apulian Aqueduct.—On May 3rd a oncession will be offered by the Italian overnment for the building of this great queduct, the cost of which is estimated at 5,400,000. A deposit of £24,000 will be quired.

All Saints' Church, Benhilton. — Three arved oak screens have been erected in the hancel from designs by Messrs. W. Hilton ash & Lionel S. Detmar, F.R.I.B.A., of ondon. The screens were made by Messrs. arry Hems & Sons, of Exeter.

St. Mark's Campanile, Venice.—The old undations have been strengthened by 3,076 iles of larch of 13ft. average length and 8in. verage diameter, capable of supporting the eight of the new tower, which is estimated t about 16,000 tons. Down to the end of st year the cost of the work was £4,623. he total cost of strengthening the foundaons is estimated at £8,000.

A Queen Victoria Memorial School for e sons of Scottish sailors and soldiers is to e erected on the Kippendavie estate, about wo miles from Stirling. Accommodation ill be provided for 200 boys. The buildgs will be of rough-cast brick with stone ressings, and the estimated cost is £45,000. he work of constructing the building ill be commenced in the course of the mmer, and it is expected the work will ccupy eighteen months. The architect is r. John A. Campbell, of Glasgow.

Wooden Cottages and Insurance.—In the ournal of the Society of Arts a writer bserves in regard to this matter: "Take e most inflammable, all wood, thatched, nd in a row. The charge would be 7s. 6d, er cent. But thatch is no longer used for overing, and for a wooden cottage tiled e rate is 5s. per cent., provided the local uthority has approved of the heating rrangements and there is proper separation f the cottages one from the other, or there a brick wall between two carried up above e roof. The owner of the most inflammable ttage, valued at £150, can guard against ss by an insurance charge of 11s. 3d. per nnum, and in the case of the majority of ooden cottages of that value the annual harge would not exceed 7s. 6d."

The Strand Improvement. — Writing to e "Times" in regard to the proposed line f frontage between the churches in the trand, Mr. Frederic Harrison (who was hairman of the Improvements Committee of e London County Council in 1892, when e original scheme of the new street from olborn to the Strand was proposed and assed) says: "I should look on the line now id down as a fatal blot on the whole heme—an irreparable eyesore to London. o adhere to the sordid makeshift now rranged would be a wanton sacrifice of one f the finest opportunities London has ever ad. The penny-wise economy of saving oney by gaining a new building site will rove in the end self-destructive. . . . As we roposed the scheme in 1892, there were to be o buildings at all between the Crescent and he Strand. This open space would have iven one of the finest street views in Europe. his was sacrificed in order to gain a building te. . . . We also proposed, as the site for the indispensable county hall, the entire block between the new avenue and Lincoln's Inn Fields—having a noble frontage both west and east."

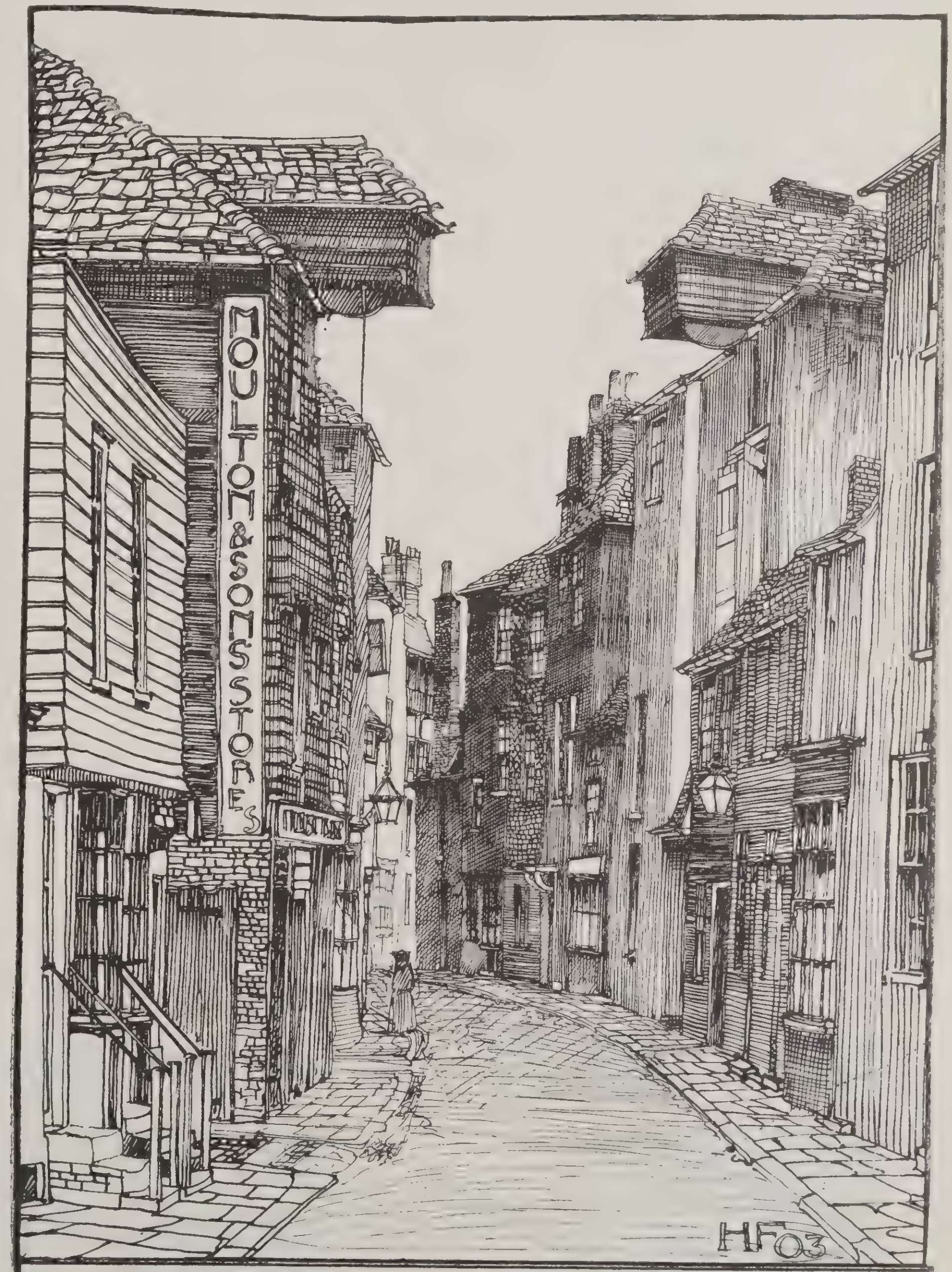
L.C.C. Fire-Stations. — Under present arrangements six new fire-stations are built in London annually and more than seventy have to be kept in repair.

A Roman Kiln has been discovered in some ancient half-timbered premises at Worcester known as King Charles's House. It is in a perfect state of preservation and is constructed entirely of ¾in. tiles and cement. It is just within the city wall, which dates back to the time of the Commonwealth; but the front of the house appears to be built upon a wall of Roman character, constructed of 2¾in. tiles and 2½in. bricks, laid alternately.

Two Houses of Historical Interest.—Commemorative tablets are to be placed by the London County Council on No. 18, Stamford Street, Southwark (the house of John Rennie, who designed London and Waterloo Bridges), and on No. 76, Charlotte Street, Fitzroy Square, W. (the house where Constable lived).

Recent Researches on the Ancient Sites of Greece and the historical geography of Western Asia, particularly Palestine, are the subjects of a course of lectures which the Liverpool Institute of Archæology has arranged to be given by Dr. Caton and the Rev. Linton Smith on successive Wednesdays.

Royal Academy Exhibition, 1905. — As already announced in our columns, the sending-in day for architectural works is Friday, March 24th, from 7 a.m. to 10 p.m. Following our practice in previous years, we shall be glad to deliver pictures at Burlington House free of charge after having made such reproductions as we desire, but we cannot undertake to receive any pictures later than 3 p.m. on the sending-in day. It would be a great convenience if architects would let us have their works in good time instead of crowding them in helter-skelter at the last moment.



STREET IN OLD HASTINGS
LOOKING·TOWARDS·FISHMARKET

DRAWN BY HAROLD FALKNER.

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Feb. 9	Twickenham—Cottages, &c.	Council	F. W. Pearce, Town Hall, Twickenham.
„ 9	Goring-on-Thames—Gasworks Extensions	Thames Valley and Water and Gas Co.	Thames Valley and Goring Water and Gas Co., 20 Bucklersbury, E.C.
„ 9	Kirton, Lincs—Laboratory	——	J. Rowell, Church Lane, Boston.
„ 9	Brighton—Three Dwellings	Town Council	F. J. C. May, Town Hall, Brighton.
„ 9	Farnham—Bridge Alterations	Rural District Council	A. J. Stedman, South Street Chambers, Farnham.
„ 9	Kilkenny, Ireland—Cottages	Rural District Council	Clerk to Council, Kilkenny, Ireland.
„ 9	Rawtenstall, Lancs—Market Hall, &c.	Corporation	J. Johnson, Municipal Offices, Rawtenstall.
„ 9	Brighton—Three Cottages	Council	F. J. C. May, Town Hall, Brighton.
„ 9	Stafford—Girls' School	Education Committee	Education Offices, Stafford.
„ 10	Heads Nook, Carlisle—House, &c.	——	Stockcale Hall, Heads Nook.
„ 10	Cork—Offices, &c.	Town Council	City Engineer's Office, Municipal Buildings, Cork.
„ 10	Southend—Extensions of Boiler-house	Corporation	E. J. Elford, Borough Engineer, Southend.
„ 11	Woking—Retort-house	District Gas Co.	W. A. Valon & Son, 140 Temple Chambers, E.C.
„ 11	Shepton Mallett—School	Education Committee	County Education Secretary, Weston-super-Mare.
„ 11	Galleywood, Essex—Foundations, &c., for Hospital	Hospital Board	A. S. Duffield, 96 High Street, Chelmsford.
„ 11	Hessenford, St. Germans—Schoolroom, &c.	——	W. Matthews, Hessenford.
„ 11	Narberth—Excise Warehouse	Mr. J. Williams	J. Williams, Narberth.
„ 11	Maesycwmmer, Wales—Chapel, &c.	Trustees of the English Baptist Church.	R. L. Roberts, Architect, Abercarn.
„ 11	Broadstairs—Steps from Parade to Sands	Urban District Council	H. Hurd, Council Offices, Broadstairs.
„ 11	Lanchester—House, &c.	Weardale and Consett Water Co.	T. E. Taylor, Prospect House, Lanchester.
„ 13	Mountain Ash, Mon.—School, &c.	Urban District Council	W. G. Thomas, Public Offices, Mountain Ash.
„ 13	Portsmouth—School	Education Committee	G. C. V. Inkpen, 40 Commercial Road, Portsmouth.
„ 13	Mountain Ash—Thirty-seven Cottages	Aberffrwd Building Club	Morgan & Elford, Mountain Ash.
„ 13	Gainsborough—Additions to Bakery	Industrial Co-operative Society	E. F. Green, Silver Street, Gainsborough.
„ 14	South Kensington—Generating Station	Commissioners	Secretary, H.M. Office of Works, Storey's Gate, S.W.
„ 14	London, W.—Generating Station	Commissioners	Chief Engineer, H.M. Office of Works, Storey's Gate, S.W.
„ 14	Londonderry—Rebuilding, &c., Business Premises	Mr. A. Daly	J. P. M'Grath, Commercial Buildings, Foyle Street, Londonderry.
„ 14	Epworth—House, &c.	——	H. Kelsey, Queen Street, Epworth.
„ 15	Monkton—Alterations, &c., to Court Hall	——	Harbottle & Son, County Chambers, Exeter.
„ 15	Elgin—Purification Works	Combination of Rothes Distillers.	C. G. Doig, Architect, Elgin.
„ 15	Great Horton, Bradford—Warehouse	Industrial Society, Ltd.	J. Drake & Son, Architect, Queensbury.
„ 16	Abergavenny—Repairs to Cottages	——	Gas Manager, Gas Works, Abergavenny.
„ 16	Beaminster—School	Governors	R. Leigh, Beaminster.
„ 17	Atcham—Additional Storey to Bathroom	Guardians	Union Offices, St. John's Hill, Shrewsbury.
„ 17	Oulton, near Lowestoft—Enlargement of Buildings	County Education Committee	F. W. Richards, 14 Stanley Street, Lowestoft.
„ 17	Sheffield—Widening Bridge	Improvement Committee	C. F. Wike, Town Hall, Sheffield.
„ 17	Willesden—Enlargement of Sorting Office	Commissioners	J. Wager, H.M. Office of Works, Storey's Gate, S.W.
„ 18	Polseath—House	——	G. T. Trevail, Court Place, Wadebridge.
„ 18	Harrow-on-the-Hill—Isolation Ward at Hospital	Urban District Council	J. Percy Bennetts, Surveyor, Harrow-on-the-Hill.
„ 20	Hoo, Kent—Enlargement, &c., of Schools	Education Committee	G. E. Bond, Pier Chambers, Chatham.
„ 20	Nottingham—Engine- and Boiler-house	Water Committee	W. B. Starr, 12 St. Peter's Gate, Nottingham.
„ 21	Farnborough—Four Cottages	——	W. Bartlett, Jessie Cottage, Rectory Road, Farnborough.
„ 22	Dartford—Buildings to Hospital	Metropolitan Asylums Board	Office of Board, Embankment.
„ 23	Belgrave, Leicester—House, &c.	Sewage Works and Farms Committee.	E. G. Mawbey, Town Hall, Leicester.
„ 28	Preston—School	Corporation	Director of Education, Education Offices, Preston.
„ 28	Gateshead—Wesleyan Church	——	W. S. Ellison, 2 Sir Thomas Street, Liverpool.
	ENGINEERING:		
Feb. 7	Sheffield—Widening Bridge	Improvement Committee	C. F. Wike, Town Hall, Sheffield.
„ 9	Twickenham—Pumping Station	Urban District Council	F. W. Pearce, Town Hall, Twickenham.
„ 9	Bridlington—Electric Lighting	Corporation	J. Lomas, Electricity Works, Quay Road.
„ 10	Beeston, Cheshire—Sinking Borehole	Rural District Council	H. B. Killan, 20 Cooper Street, Manchester.
„ 11	Woking—Gasholder, &c.	District Gas Co.	W. A. Valon & Son, 140 Temple Chambers, E.C.
„ 13	Todmorden—Purifiers	Gas Committee	Gasworks, Millwood, Todmorden.
„ 13	Nottingham—Reservoir	Water Committee	F. W. Davies, Water Office, Peter's Square, Nottingham.
„ 14	Bangor, Ireland—Laying of Water Mains, &c.	Urban District Council	J. Milliken, Town Hall, Bangor.
„ 14	Ballina, Ireland—Town Lighting	Urban District Council	M. E. Browne, Clerk, Ballina.
„ 15	Stockport—Booster	Gas and Electricity Committee	A. J. H. Carter, Millgate, Stockport.
„ 15	London, N.—Flour Dressing Machine	Guardians	E. Davey, St. John's Road, Upper Holloway, N.
„ 15	North Sunderland—Reservoir	Trustees	Office of Trustees of Lord Crewe's Charity, 61 Westgate Rd., Newcastle.
„ 17	Cape Clear, co. Cork—Breakwater, &c.	——	Assistant Surveyor of Buildings, 1 River View, Summer Hill, Cork.
„ 17	Salford—Heating Schools	Education Committee	C. K. & T. C. Mayor, 41 John Dalton Street, Manchester.
„ 18	Bury, Lancs—Waterworks, &c.	Water Board	J. Cartwright, Peel Chambers, Bury.
„ 18	Chapel-en-Frith—Waterworks	Rural District Council	Swann & Brady, Town Hall, Chapel-en-Frith.
„ 20	Hamilton, N.B.—Septic Tanks	Town Council	Wyllie & Blake, 219 St. Vincent Street, Glasgow.
„ 22	Newcastle-under-Lyme, Staffs—Pumping Machinery	Corporation	Wilcox & Raikes, 63 Temple Row, Birmingham.
„ 27	Copenhagen—Gasmeter	Corporation	Valby Gasworks, Valbys, Copenhagen.
„ 27	Salford—Heating Schools	Education Committee	C. K. & T. C. Mayor, 41 John Dalton Street, Manchester.
„ 28	Ashton-in-Makerfield—Gas Plant	Urban District Council	Gasworks, Ashton-in-Makerfield.
March 1	Southsea—Reconstructing Pier-head	S. Parade Pier Co.	G. E. Smith, 145 Victoria Road N., Southsea.
„ 31	Shanghai—Electric Tramways	Municipal Council	J. Poor & Co., 63 Leadenhall Street, E.C.
April 1	Lulea, Sweden—Dredging	——	Harbour Office, Lulea, Sweden.
„ 10	St. George's Harbour, Bermuda—Deepening, &c., Channel	Government	Coode & Son & Matthews, 9 Victoria Street, S.W.
May 1	Suakin (Red Sea)—Lighthouse	Ports and Lights Administration	Deputy-Controller-General, Ports and Lights Administration, Alexandria Egypt.
	IRON AND STEEL:		
Feb. 9	London, W.—Ironmongery	Chiswick U.D.C.	J. Barclay, Town Hall, Chiswick.
„ 9	West Ham—Ironmongery	Town Council	Borough Engineer's Office, Town Hall, Stratford, E.
„ 9	Barry, Wales—Pipes	Urban District Council	E. W. Waite, Gas and Water Offices, Barry.
„ 9	Birkenhead—Cast-iron Pipes	Corporation	Gas Engineer, Gasworks, Birkenhead.
„ 9	Woolwich—Ironmongery, &c.	Borough Council	F. Sumner, Maxey Road, Plumstead.
„ 10	London, N.E.—Wire Fencing	London County Council	Parks Department, 11 Regent Street, W.
„ 10	Belfast—Telegraph Ironwork, &c.	Midland Railway Co. Northern Counties Committee.	General Stores Department, Belfast.
„ 11	Blackburn—Rails, Screws, &c.	Corporation	W. Stubbs, Municipal Offices, Blackburn.
„ 11	Sedgefield, Durham—Two Iron Verandahs	——	W. Grozier, Shire Hall, Durham.
„ 13	Hendon—Ironmongery	Urban District Council	S. S. Grimley, Engineer to Council, Hendon.
„ 14	Bury, Lancs—Ironmongery	Sewering, Paving and Streets Committee.	A. W. Bradley, Borough Engineer, Bury.
„ 14	London, S.W.—Steel Rails	——	Crown Agents for Colonies, Whitehall Gardens, S.W.
„ 14	Merthyr Tydfil—Pipes	Urban District Council	G. F. Deacon, 16 Great George Street, S.W.
„ 15	Hampstead—Ironmongery, &c.	Council	Borough Engineer, Town Hall, Haverstock Hill, N.W.
„ 15	London, N.W.—Iron Castings, &c.	Hampstead Borough Council	Borough Engineer, Town Hall, Haverstock Hill, N.W.
„ 15	London, S.E.—Ironmongery	Southwark Borough Council	Town Clerk, Town Hall, Walworth Road, S.E.
„ 16	Canterbury—Iron Manhole-covers, &c.	Roads and Survey Committee	A. C. Turley, City Surveyor, Canterbury.
„ 18	Richmond, Surrey—Ironmongery, &c.	Town Council	T. B. Senior, Town Hall, Richmond.
„ 18	Chapel-en-Frith—Pipes	Rural District Council	Swann & Brady, Town Hall, Chapel-en-Frith.
„ 20	London, N.E.—Ironmongery	Bethnal Green Borough Council	Borough Surveyor, Town Hall, Bethnal Green.
„ 20	London, N.—Ironmongery, &c.	Hornsey Town Council	R. J. Lovegrove, 99 Southwood Lane, Highgate.
„ 27	Urmston, Lancs—Gates and Railings	Urban District Council	Council's Surveyor, Urmston, Lancs.
March 7	Brisbane, Australia—Rails, &c.	——	Agent-General for Queensland, 1 Victoria Street, S.W.
	PAINTING AND PLUMBING:		
Feb. 9	West Ham—Oils, Colours, &c.	Town Council	Borough Engineer's Office, Town Hall, Stratford, E.
„ 9	London, W.—Oils, &c.	Chiswick U.D.C.	J. Barclay, Town Hall, Chiswick.
„ 9	Porthcawl, Wales—Painting, &c.	——	"The Rest," Porthcawl.
„ 9	Birkenhead—Paints and Oils	Corporation	Gas Engineer, Gasworks, Birkenhead.
„ 10	Belfast—Oils and Colours	Midland Railway Co. Northern Counties Committee.	General Stores Department, Belfast.
„ 11	Blackburn—Paints, &c.	Corporation	W. Stubbs, Municipal Offices, Blackburn.

Complete List of Contracts Open.—*continued.*

ATE OF ELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	PAINTING AND PLUMBING—*cont*		
b. 11	London, E.—Colours, Oils, &c.	Stepney Borough Council ...	M. W. Jameson, Municipal Offices, 15 Great Alie Street, Whitechapel.
,, 14	Bury, Lancs—Oils and Paints	Sewering, Paving and Streets Committee.	A. W. Bradley, Borough Engineer, Bury.
,, 15	London, S.E.—Oils and Colours...	Southwark Borough Council ...	Town Clerk, Town Hall, Walworth Road, S.E.
,, 18	Plymouth—Paint and Oil	Corporation...	J. Paton, Borough Engineer, Plymouth.
,, 20	London, N.—Paints and Oils	Bethnal Green Borough Council	Borough Engineer, Town Hall, Bethnal Green.
	ROADS AND CARTAGE:		
eb. 9	West Ham—Paving Materials, &c.	Council	Borough Electrical Engineer's Office, Town Hall, Stratford, E.
,, 9	Hull—Granite...	Corporation...	A. E. White, Town Hall, Hull.
,, 9	Llandudno—Road-making, &c.	Urban District Council	E. P. Stephenson, Town Hall, Llandudno.
,, 9	Leek, Staffs—Street Works	Urban District Council	W. E. Beacham, Town Hall, Leek.
,, 9	Woolwich—Cement, &c.	Borough Council	F. Sumner, Maxey Road, Plumstead.
,, 10	Downham Market, Norfolk—Broken Granite	Rural District Council	H. Wayman, Union Offices, Downham Market.
,, 10	Pentre, Rhondda, Wales—Street Works	Urban District Council	Public Offices, Pentre.
,, 10	Wisbech—Granite, &c.	Rural District Council	A. G. Catling, 4 Post Office Lane, Wisbech.
,, 11	London, E.—Cement, &c....	Stepney Borough Council ...	M. W. Jameson, Municipal Offices, 15 Great Alie Street, Whitechapel.
,, 11	East Retford—Granite and Slag...	Rural District Council	T. Henry, Surveyor, Retford.
,, 11	Leigh, Lancs—Concrete Flags, &c.	Corporation...	T. Hunter, Bank Chambers, Leigh, Lancs.
,, 11	Chelmsford—Granite Kerb and Setts	County Council	P. J. Sheldon, Surveyor, Chelmsford.
,, 13	Mirfield, Yorks—Street Works	Urban District Council	E. Gill, Council Offices, Fold Head, Mirfield.
,, 13	Bristol—Paving Materials	Sanitary and Improvement Committee.	T. H. Yabbicom, 63 Queen Square, Bristol.
,, 14	Long Sutton, Lincs—Granite, &c.	Urban District Council	S. S. Mossop, Clerk, Long Sutton.
,, 14	Potterspury, Stony Stratford—Granite and Slag	Urban District Council	J. B. Fairchild, Potterspury, Stony Stratford.
,, 15	London, S.E.—Broken Granite, &c.	Southwark Borough Council ...	Town Clerk, Town Hall, Walworth Road, S.E.
,, 15	Chadwell St. Mary, Essex—Road Works	Rural District Council	F. Lowry, Hornchurch.
,, 15	Grimsby—Street Works	———	H. C. Scaping, Town Hall Square, Grimsby.
,, 15	Folkestone—Granite and Chippings	Corporation...	A. E. Nichols, Corporation Offices, Folkestone.
,, 15	Hampstead—Granite Paving, &c.	Council	Borough Engineer, Town Hall, Haverstock Hill, N.W.
,, 16	Canterbury—Gravel and Stone	Roads and Survey Committee...	A. C. Turley, City Surveyor, Canterbury.
,, 17	Urmston, Lancs—Paving, &c.	Urban District Council	J. Heath, Council Offices, Urmston.
,, 18	St. Thomas, near Exeter—Road Materials	Rural District Council	A. E. Ward, 9 Bedford Circus, Exeter.
,, 18	Richmond, Surrey—Cartage of Road Materials	Town Council	F. B. Senior, Town Hall, Richmond.
,, 20	London, N.E.—Flints, &c.	Bethnal Green Borough Council	Borough Surveyor, Town Hall, Bethnal Green.
,, 20	Hornsey—Road Materials, &c.	Town Council	E. J. Lovegrove, 99 Southwark Lane, Highgate.
,, 20	Beckenham—Making-up Roads	Urban District Council	J. A. Angell, Surveyor to Council, Beckenham.
,, 22	Wanstead, Essex—Making-up Streets	Urban District Council	Surveyor's Department, Council Offices, Wanstead.
,, 25	Stratton, Cornwall—Road, &c.	Rural District Council	W. J. Dunbar, Liskeard, Cornwall.
,, 26	Harrogate—Street Works	Corporation...	F. Bagshaw, Borough Engineer, Harrogate.
,, 27	Old Hill, Staffs—Road Stone	Rowley Regis U.D.C.	Council Offices, Lawrence Lane, Old Hill.
,, 28	Hatfield, Herts—Granite and Slag	County Council	U. A. Smith, County Surveyor, Hatfield.
	SANITARY:		
eb. 9	London, W.—Disinfectants	Urban District Council	J. Barclay, Town Hall, Chiswick.
,, 9	West Ham—Sanitary Articles	Town Council	Borough Engineer's Office, Town Hall, Stratford, E.
,, 9	Woolwich—Disinfectants, &c.	Borough Council	F. Sumner, Maxey Road, Plumstead.
,, 10	London, S.W.—Sewer	Westminster City Council ...	Works Department, Westminster City Hall, Charing Cross Road.
,, 11	London, E.—Disinfectants	Stepney Borough Council ...	M. W. Jameson, Municipal Offices, 15 Great Alie Street, Whitechapel.
,, 13	Hendon—Drainage Works, &c.	Urban District Council	S. S. Grimley, Engineer to Council, Hendon.
,, 13	Scotstoun and Jordanhill, N.B.—Construction of Sewers...	Upper District Committee ...	W. R. Copland, 146 West Regent Street, Glasgow.
,, 13	Dagenham, Essex—Sewers	Romford R.D.C.	W. Smith, 24 North Street, Romford, Essex.
,, 13	Blackburn—Sewerage, &c.	Corporation...	W. Stubbs, Municipal Offices, Blackburn.
,, 15	Folkestone—Drain Pipes	Corporation...	A. E. Nichols, Corporation Offices, Folkestone.
,, 15	Plymouth—Sanitary Fluid, &c.	Corporation...	J. Paton, Borough Engineer, Plymouth.
,, 15	Hampstead—Drain Pipes, &c.	Council	Borough Engineer, Town Hall, Haverstock Hill, N.W.
,, 15	London, S.E.—Disinfectants	Southwark Borough Council ...	Town Clerk, Town Hall, Walworth Road, S.E.
,, 15	London, N.W.—Disinfectants, &c.	Hampstead Borough Council ...	Borough Engineer, Town Hall, Haverstock Hill, N.W.
,, 16	Canterbury—Disinfectant Fluid and Powder	Roads and Survey Committee ...	A. C. Turley, City Surveyor, Canterbury.
,, 20	London, N.E.—Drain Pipes	Bethnal Green Borough Council	Borough Surveyor, Town Hall, Bethnal Green.
,, 22	Newcastle-under-Lyme—Sewers...	Corporation...	Willcox & Raikes, 63 Temple Row, Birmingham.
,, 28	Stony Stratford and Wolverton—Sewerage Works... ...	Rural District Council	A. E. Abbott, The Square, Wolverton.
	TIMBER:		
eb. 15	London, S.E.—Wood Blocks	Southwark Borough Council ...	Town Clerk, Town Hall, Walworth Road, S.E.

List of Competitions Open.

ATE OF ELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
eb. 28	Aylesbury—School	£50 & £25	£1 1s.	C. G. Watkins, Education Office, Aylesbury.
,, 28	Wolverton—School	———	£1 1s.	C. G. Watkins, Education Office, Aylesbury.
ar. 4	Nelson, Lancs—Library...	£50, £25 & £15	———	J. Baldwick, Town Hall, Nelson.
,, 30	London, S.W.—Municipal Buildings...	£3 3s.	— —	H. J. Smith, Town Hall, Kennington Green, S.E.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

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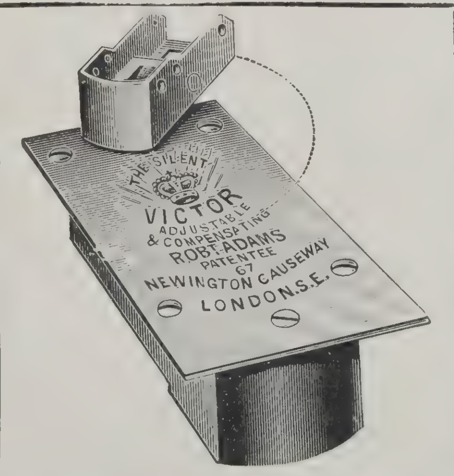

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D. J. PURCELL,
Clerk of Council.

Council Offices, Naas,
2nd February, 1905.

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Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

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C. Jones	£7,298
Winter	7,249
G. Bentley & Co.	7,150
Shepherd	6,999
Pratt	6,975
Moore & Page	6,950
Penney & Co.	6,830
Knight	6,780
Saunders*	6,729

* Accepted.

Barry.—For the erection of a new boys' school in Romilly Road, for the U.D.C. Mr. G. A. Birkenhead, architect, Caledonian Chambers, Cardiff, and 101, Holton Road, Barry :—

Lloyd & Tape	£5,426	10	0
A. Richards	5,300	0	0
E. Turner & Sons, Cardiff	5,275	0	0
Jones Brothers	5,250	0	0
G. Griffiths & Son, Cardiff	5,245	0	0
J. Allan & Sons, Cardiff	5,200	0	0
J. Prout	5,058	17	6
W. T. Morgan, Cardiff	5,050	0	0
J. Charles, Newport, Mon.	5,000	0	0
H. S. Rendell	4,986	0	0
W. Thomas & Co., Cardiff	4,938	0	0
W. Britton*	4,865	10	0
T. Bevan, Penarth	4,848	0	0
D. W. Davies, Cardiff	4,798	0	0

* Accepted.

[Architect's estimate, £4,932.] [Rest of Barry.]

Exeter.—For the erection of shops and dwellings at 29 and 30, Bridge Street, for Mr. Troke. Mr. R. M. Challice, architect, 14, Bedford Circus, Exeter :—

Ham & Passmore	£2,041
L. Smale	2,022
W. G. Coles, Alphington	1,996
Westcott, Austin & White*	1,740
G. Setter	1,700
C. Heath, Crediton	1,698

* Accepted. [Rest of Exeter.]

Foleshill (Coventry).—For the erection of an infectious diseases hospital to be built on a site in the parish of Exhall, for the Foleshill R.D.C. Mr. T. F. Tickner, M.S.A., architect, High Street Chambers, Coventry:—

S. Butterworth & Sons, Ltd., Hornby Road, Blackpool	£7,115	15	0
W. Hopkins, Thorp Street, Birmingham	7,000	0	0
J. Worwood, Much Park Street	6,940	18	4
A. A. Wincott, Foleshill Road	6,650	0	0
E. Giles & Son, Cherrywood Road, Small Heath, Birmingham	6,591	0	0
Burton & Crease, Stoke	6,541	0	0
J. Isaac & Sons, Foleshill	6,539	6	6
C. Hope, Berkswell	6,500	0	0
T. Bailey, Leamington Spa	6,434	0	0
C. Garlick, Far Gosford Street	6,355	0	0
G. Mobbs, 462, Bolton Road, Small Heath, Birmingham	6,320	9	0
Bowles & Son, 8, Gladstone Street, Leicester	6,292	12	6
Orr Brothers, Foleshill	6,288	0	0
H. Goode, Holmsdale Road, Great Heath	6,230	0	0
Kelley & Son,* Little Heath, Foleshill	6,185	15	0
Sharratt & Hartlett, Bedworth, near Coventry	6,180	12	9
C. G. Hill, Godwin Street	6,156	0	0
A. J. Lord, Wolston, near Coventry	5,543	0	0

* Accepted provisionally. [Rest of Coventry.]

Kemeys (Mon.).—Accepted for the erection of a bridge, for the Monmouthshire County Council :—

G. Palmer, Neath	£5,388

Kidderminster.—For the execution of water scheme (contract No. 3). Messrs. Willcox & Raikes, engineers, 63, Temple Row, Birmingham :—

R. H. B. Neal, Ltd., Plymouth	£12,813	0	0
W. M. Willetts & Sons, Old Hill	11,979	0	0
J. Jackson, Langley	11,560	0	0
A. B. & M. Tilt, Bromsgrove	11,514	16	2
J. Guest & Sons, Amblecote	11,500	0	0
J. A. Meredith, Cradeley	10,930	0	0
M. Warrington, Hyde	10,723	0	0
C. A. Horton, Brierley Hill	10,688	0	0
H. Smith, Wolverley	10,266	0	0
G. Law, Kidderminster	10,155	0	0
T. Lowe & Sons, Burton-on-Trent	9,950	0	0
C. Griffiths, Lye, Stourbridge	9,850	0	0
G. E. Jackson, Oldbury	9,548	0	0
E. Haycock & Sons, Leicester	9,400	0	0
T. Vale & Sons,* Ltd., Stourport	9,295	0	0
H. Dorse, Cradeley	9,172	0	0

* Accepted. [Engineers' estimate, £9,582.

Lutterworth.—For the erection and completion of a small police-court, cottage, &c., for the Leicestershire County Council. Mr. S. Perkins Pick, F.R.I.B.A., county architect, 6, Millstone Lane, Leicester :—

J. Parnell & Son, Rugby	£3,701	10	0
G. Henderson, Newark	3,590	0	0
G. Mobbs, Small Heath, Birmingham	3,477	0	0
T. Herbert	3,442	0	0
W. Moss & Sons, Ltd., Loughborough	3,425	0	0
J. W. Sawbridge, Lutterworth	3,415	0	0
King & Ridley, Lutterworth	3,380	0	0
H. Herbert & Sons	3,377	0	0
T. Barker & Son, Loughborough	3,375	0	0
A. Faulks, Loughborough	3,340	0	0
J. H. Vickers, Nottingham	£3,330	0	0
J. Bentley & Co.	3,300	0	0
F. Sleath, Rothley, near Loughborough	3,285	0	0
J. Rudkin & Son	3,275	0	0
Leicester Builders, Ltd.	3,268	3	3
Haskard, Rudkin & Beck	3,180	0	0
T. Barlow & Co., Nottingham	3,128	0	0
C. Wright	3,100	0	0
Storer Brothers	3,015	6	0

[Rest of Leicester.]

Melrose.—For the erection of a wing for female patients at the asylum, for the Roxburgh District Board of Lunacy. Messrs. Sydney Mitchell & Wilson, architects, 13, Young Street, Edinburgh :—

A. Meiklejohn	£8,595	0	7
R. Hall & Co.	8,211	0	0
J. Adam & Co.	8,111	0	0
A. Herbertson & Son	8,000	0	0
J. Spiers	7,985	4	0
A. Inglis & Sons	7,710	0	0
W. Linton	7,674	8	3
A. Scott & Sons	7,595	0	0
W. Scott	7,592	0	0
H. T. & R. Montgomery	7,428	10	0
Neil, McLeod & Sons	7,363	0	0
J. & F. Forest	7,176	0	0
Scott & Brown	7,058	14	0
A. Calder,* 13, Barclay Place, Edinburgh	7,050	0	0

* Accepted.

Over (Cheshire).—For alterations and additions to the school buildings in High Street, for the Administrative Sub-Committee for the Winsford and Middlewich District :—

Executors of H. Sergeant, Winsford	£4,946	0	0
J. Williams & Sons, Crewe	4,963	3	7
T. W. Meadows, Stockport	4,754	0	0
J. Mayers & Son, Chester	4,589	14	0
W. Dickenson, Winsford	4,338	10	0
S. Robinson & Sons, Hyde	4,190	0	0
J. Fowles & Sons,* Winsford, Cheshire	3,948	0	0

* Accepted.

Rowington (Warcs.).—For addition to house, Pinley Hill, for Mr. W. H. Margetts. F. P. Trepess, F.I.A.S., architect, Warwick. Quantities by architect :—

J. H. Cashmore & Sons, Warwick	£698	10	0
Bragg & Sons, Solihull	666	10	0
A. & J. Chaplin,* Warwick	657	0	0

* Accepted.

South Shields.—Accepted for the erection of an infants' school in Gilbert Street, for the Education Committee :—

Glen & Moffett, Jarrow-on-Tyne	£5,516

Southampton.—For the erection of ten cottages on the area north of Simnel Street, for the Corporation. Mr. C. J. Hair, architect, 23, Portland Street, Southampton :—

H. Stevens & Co.	£2,631	0	0
L. J. Richards	2,520	0	0
H. J. Hood	2,506	15	0
T. H. Stiles	2,470	0	0
Jenkins & Sons, Ltd.	2,466	0	0
F. Osman	2,457	10	0
Executors of W. Franklin	2,393	0	0
Golding & Ansell	2,290	0	0
J. Nichol, Southampton*	2,232	0	0

* Accepted.

Surbiton.—For making-up Bond, Douglas (part of) and Thornhill Roads, for the U.D.C. :—

J. Mowlem & Co., Westminster	£4,912	0	0
T. Free & Sons, Maidenhead	4,575	0	0
F. Thacker, Balham	4,500	0	0
T. Kavanagh & Co.,* Surbiton	4,390	7	9

* Accepted. [Surveyor's estimate, £4,325 13s.]

Sutton-in-Ashfield.—For the erection of a Congregational church. Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines, architects, 5, Clement's Inn, Strand, London, W.C. :—

	Estimate "A."		
T. H. Kingerlee & Sons	£4,261	0	0
Vallance & Blythe	4,223	0	0
F. Messom	4,179	0	0
Coulson & Lofts	4,060	0	0
C. North	3,958	0	0
Kerridge & Shaw	3,926	0	0
W. Mawle & Co.	3,612	10	0
T. Barlow & Co.	3,500	0	0
A. Earnshaw	3,356	0	0
J. Greenwood,* Wood Street, Mansfield	3,320	0	0

* Accepted.

Wellingborough.—For the erection of a Baptist church. Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines, architects, 5, Clement's Inn, Strand, London, W.C. :—

	Estimate "A."		
Kerridge & Shaw	£2,649	0	9
A. T. Hawtin	2,460	0	0
C. E. Bayes	2,440	0	0
Goodman & Murkitt	2,409	0	0
H. Green	2,398	0	0
Hacksley Brothers	2,379	0	0
R. Marriott	2,375	0	0
O. P. Drevor	2,359	9	0
G. Henson	2,350	0	0
W. Stevens	2,343	6	0
E. Brown & Son,* Castle Street, Wellingborough	2,325	0	0

* Accepted.

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	316	Do. stout	21 × 43	9/-
	317	Thin glazed	21 × 43	6/-
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	319	Do. white parchment	21 × 40	11/9
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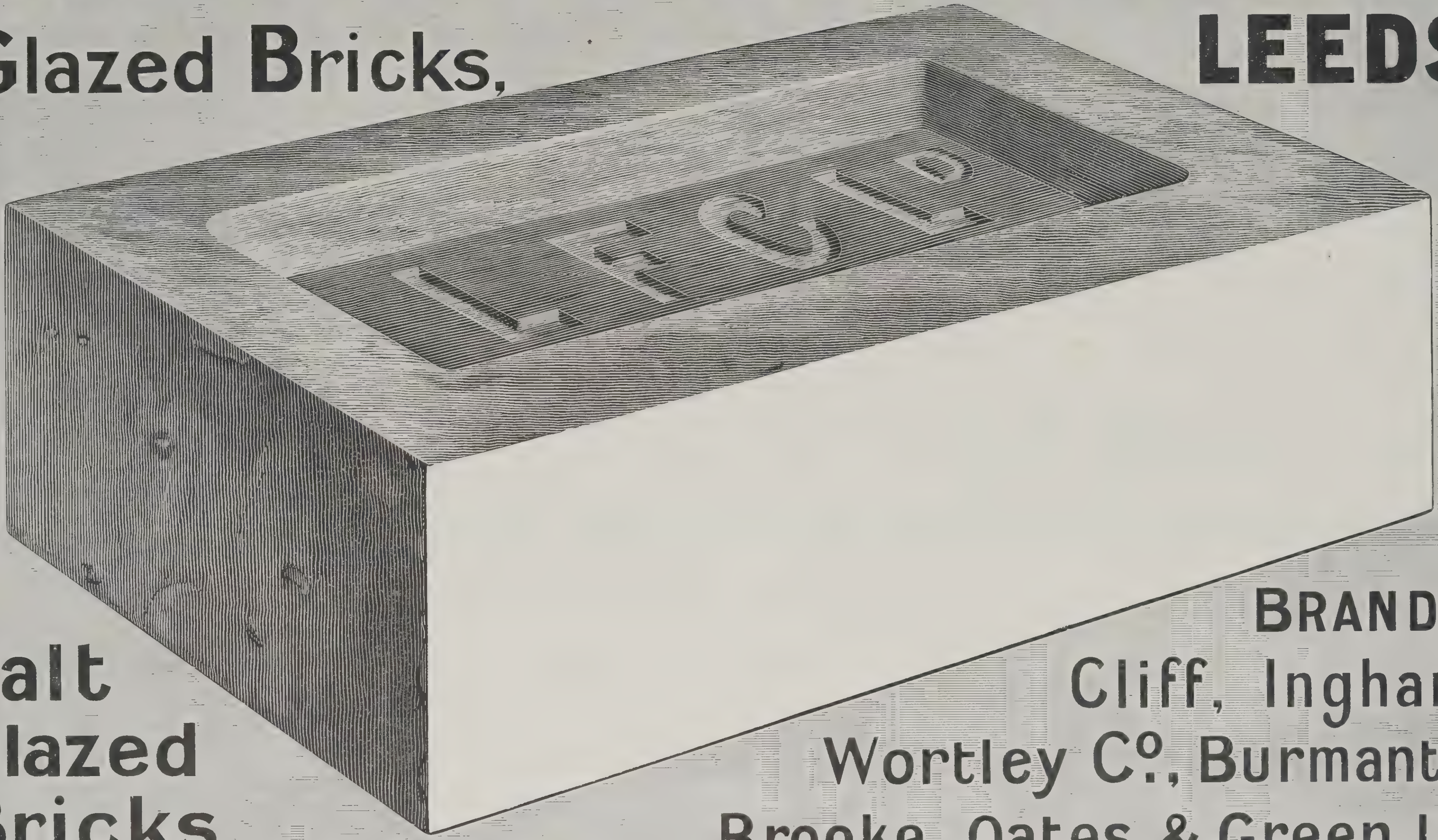

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Beans	per qr.	1	10	0	1	17	0
Clover, best	per load	3	15	0	4	5	0
Hay, good	do.	3	10	0	3	17	0
Sainfoin mixture ...	do.	3	10	0	3	17	6
Straw	do.	1	12	0	2	2	0
OILS AND PAINTS.							
Castor Oil, French ...	per cwt.	1	0	5		—	
Colza Oil, English ...	do.	1	1	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0		—	
Linseed Oil, barrels ...	per cwt.	0	14	$7\frac{1}{2}$		—	
Petroleum, American ...	per gal.	0	0	$5\frac{3}{8}$		—	
Do. Russian ...	do.	0	0	$4\frac{3}{4}$		—	
Pitch	per barrel	0	8	0		—	
Shellac, orange	per cwt.	7	0	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	4	6		—	
Tar, Stockholm	per barrel	1	5	0		—	
Turpentine	per cwt.	1	17	$4\frac{1}{2}$		—	
METALS.							
Copper, sheet, strong ...	per ton	80	0	0		—	
Iron, Staffs., bar ...	do.	5	17	6	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	7	6	10	10	0
Lead, pig, Soft Foreign...	do.	12	13	9	12	15	0
Do. do. English common brands	do.	13	0	0		—	
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14	0	0		—	
Do. pipe	do.	15	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	5	0		—	
Do. floor brads... ...	do.	9	0	0		—	
Steel, Staffs., Girders and Angles	do.	5	10	0	6	0	0
Do. do. Mild bars ...	do.		0	0	6	5	0
Tin, Foreign	do.	130	10	0	131	0	0
Do. English ingots ...	do.	131	0	0	133	0	0
Zinc, sheets, Silesian ...	do.	28	0	0		—	
Do. do. Vielle Montaigne	do.	29	0	0		—	
Do. Spelter	do.	24	12	6	25	0	0
TIMBER.							
Soft Woods.							
Whitewood, American, logs.	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	1	6
Fir, Dantzic and Memel	per load	2	7	6	4	15	0
Pine, Quebec, Yellow ...	do.	4	0	0	7	0	0
Do. Pitch, American...	do.	2	10	0	6	0	0
Laths, log. Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, St. Petersburg, Yellow, 1st, 3×9	per std.	11	15	0	13	0	0
Do. do. do. do. 3×7	do.	10	10	0		—	
Do. do. do. 2nd, 3×11	do.	9	15	0		—	
Do. do. do. do. 3×9	do.	9	15	0		—	
Do. Petschora, Yellow, 2nd, 3×9	do.	14	10	0		—	
Do. Skelleftea, Yellow, 5th, 3×9	do.	9	10	0		—	
Do. Söderhamn, Yellow, 3rd, 3×9	do.	13	0	0		—	
Do. Rimouski and Matane, Spruce, Unsorted ... 3×9	do.	9	0	0		—	
Do. Norrkoping, White, Unsorted, 3×9	do.	8	5	0		—	
Do. do. do. do. 3×8	do.	7	15	0		—	
Do. Norva, Yellow, 3rd, $2\frac{1}{2}$×7	do.	7	15	0		—	
Battens, all kinds ...	do.	5	15	0	9	10	0
Flooring Boards 1in. prepared, 1st... ...	per square	0	10	0	0	12	3
Do. 2nd	do.	0	8	0	0	9	3
Do. 3rd, &c.	do.	0	7	0	0	9	3
Hard Woods.							
Ash, Quebec	per load	4	10	0	7	15	0
Birch, New Brunswick...	do.	2	15	0	6	0	0
Box, Turkey	per ton	8	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	$3\frac{1}{2}$		—	
Do. Honduras ...	do.	0	0	$5\frac{7}{32}$		—	
Do. Tobasco	do.	0	0	$5\frac{3}{32}$		—	
Elm, Quebec	per load	4	5	0	8	15	0
Mahogany, Average Price for Cargo, Honduras...	per ft. sup.	0	0	$4\frac{5}{8}$		—	
Do. African ...	do.	0	0	$3\frac{11}{32}$		—	
Do. St. Domingo	do.	0	0	4		—	
Do. Cuba ...	do.	0	0	$6\frac{1}{4}$		—	
Do. Lagos ...	do.	0	0	$4\frac{7}{32}$		—	
Do. Benin ...	do.	0	0	$2\frac{21}{32}$		—	
Do. Tobasco ...	do.	0	0	$4\frac{31}{32}$		—	
Oak, Wainscot	per log.	2	5	0	5	15	0
Do. American quartered, planks and boards	per ft. cu.	0	2	6	0	5	0

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THE
BUILDERS' JOURNAL
AND ARCHITECTURAL RECORD.

February 15, 1905. Vol. 21, No. 523. 6, Great New Street, Fetter Lane, E.C.

Summary.

In the erection of the huge new power station at Chelsea for the electrified "Underground" 8,000 tons of steel have been used and six million Fletton bricks. The work was executed in record time. Current is generated at 11,000 volts and transformed to 600 volts on the rails. (Page 84.)

The London Building Acts Amendment Bill will be opposed by the metropolitan local authorities, the property owners' association, the London Chamber of Commerce, the City Corporation and the R.I.B.A. (Page 86.)

In order that different temperatures may be maintained in different rooms the air-supply ducts are made double, the passage for warm air being placed over that for cold air and the branch ducts for each room so arranged that they can draw their supply from either or both. For filtering the air a coke screen is best. (Page 90.)

A most interesting application of reinforced concrete is afforded by the platform of the new bridge at Luxemburg. This is on the Coignet system, and consists of slabs and beams resting on the walls of the archways. The beams were prepared in advance and brought into position on a truck running on one of the walls, and they were made to support the centering for the slabs. (Page 93.)

In a case recently heard at the Liverpool County Court the question was whether a tenant was liable for dry-rot in his house because he had allowed ivy and creepers to grow over the ventilation holes of the foundation walls and had used brown paper under carpets. The jury decided he was not liable, holding that the dry-rot was due to inherent defects in the building. (Page 92.)

The First Garden City is to be called Letchworth. (Page 85.)

Mr. John Leaning died recently as the result of an operation for appendicitis. (Page 96.)

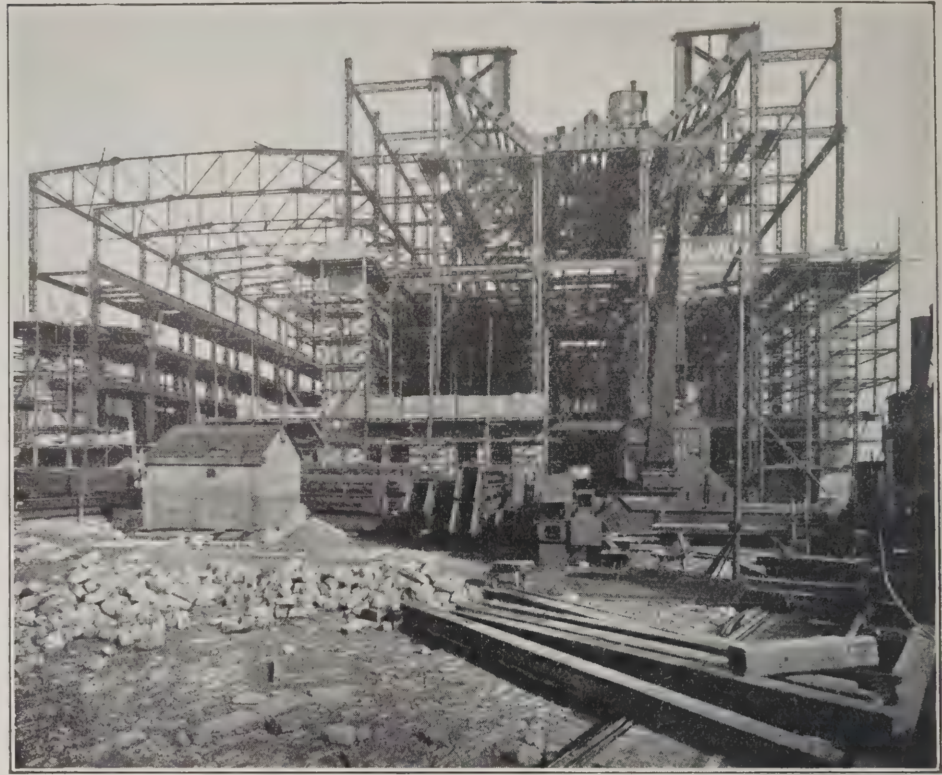
The Holborn-Strand improvement scheme will be finished by the end of this year. (Page 96.)

In a paper on church fittings read before the Architectural Association last Friday Mr. Charles Spooner said 3ft. 5ins. was the most convenient height for an altar and 2ft. 6ins. was sufficient width. The five liturgical colours of the Church of England were white, red, green, purple and black, so that five frontals were required. A rood loft was hardly necessary, as nowadays we no longer engaged strolling minstrels who had to be put where they could not get at valuables. The eagle lectern, if artistically treated and made very much unlike the real bird, might be rather nice, but the form of a single or double desk was better. As to pews, the best modern ones he had seen were designed by Mr. Norman Shaw for the church at Bedford Park. (Page 94.)

Temporary Ballrooms. The action of Mr. Lionel Phillips, of Grosvenor Square, brought in such a public-spirited manner against a firm of caterers, has reminded the public of the very grave question of requiring official control in respect of light temporary buildings of the ballroom type—so highly inflammable and so dangerous, and yet practically exempt from expert supervision. Practically every householder can erect in his back-garden, in a yard or on the leads of a back addition a structure of wood supports and canvas, fitted with electric lighting, and then invite his numerous guests to dance or sup therein, and whilst naturally relying on due care being taken by his caterers or contractors, who should be versed in the protective measures needed, may find himself in the position of having invited his friends to a death-trap through no fault of his own. Any question of door openings, window openings or the like by which the guests can reach the open are apparently unconsidered trifles from a caterer's point of view, whilst the inflammability of the materials used and the hurried manner in which the artificial illumination is arranged are in themselves sources of the greatest danger. Everything is done in a rush, and nothing is thought of the safety of the visitors. It actually came out in evidence last week that the electrical foreman was not aware that muslin would burn, and it was even stated in court by the defendants that non-inflammable materials "could not be relied upon." Greater ignorance could surely not be shown. In this specific case the temporary building was erected on the top of a back addition and was approached from the first floor and from the ground floor. This temporary structure was intended to hold about 200 people. It was constructed of the usual vertical framing, two thicknesses of canvas and art muslin, the muslin being draped over small 5-c.p. electric lights wired on a very dangerous, though no doubt pretty, flexible wire looping system. A fire broke out and was generally (and we believe rightly) attributed to an electrical cause, although the jury did not take this view; but whatever the cause, be it electrical or not, the same danger remains. It came out in evidence that non-inflammable materials were actually not used because, it was asserted, this was not customary and they were "difficult to obtain." Seeing that non-inflammable materials have been used at all our our great public gatherings, bazaars, &c., which are under the control of the London County Council ever since the end of the 'nineties, it would be well if what holds good for public gatherings were made compulsory for temporary buildings of all kinds, whether used for private or public purposes. We believe this end could be easily obtained by extending the conditions under which borough councils give licences for temporary buildings of this kind from the structural, as distinct from the fire, point of view. We propose to deal with this case at length in our next Fire Supplement, for, thanks to Mr. Lionel Phillips bringing the matter before the Courts at great expense to himself, much that calls for public attention has been brought to light. The case was exceptionally well prepared by Messrs. Braunstein & Skelton, the solicitors, and very carefully argued by Sir Edward Clark, K.C., so that it is of considerable technical value.

The Treatment of Wood. It is a surprising thing how wood is misused by the architectural profession and the building trades of this country. It is built like masonry, twisted and bent like metal, stained to an unnatural colour, painted to imitate some other material, or grained to imitate some other variety—all because its users have no sense of its own intrinsic beauty of grain, colour and surface. Why must the architect ignorant of the principles of joinery (except for the slight smattering from a text-book which can in no wise take the place of instruction by working wood oneself) insist on designing woodwork as if it were stone, gaining stability from weight, perpendicular alignment and arch form, or as if it were metal bolted and riveted with its pegs and bolts? Timber is straight in grain, is strong in tension, and the strength of a nail and of a glued joint is remarkable. The Japanese can appreciate beauty of grain and natural colouring, but we perforce must think the more expensive the most beautiful. People are not now satisfied with oak—they stain it an unnatural green or fumigate it. Our most prized mahogany furniture is American whitewood under the stain. We English ought to blush with shame at our barefaced lying in the use of graining. We know graining cheapens the work because the trouble to get a plain colour even and pure is saved, the defects not being apparent when grained, and that the life is longer because dirt, finger-marks, cracks, &c., do not show so much as on a plain surface. Yet why cannot a simple combing be used without attempting any imitation? Beautiful effects can be obtained by combing dark colours such as green and blue, and the combing may take the form of patterns.

THE "UNDERGROUND" ELECTRICITY POWER STATION AT CHELSEA.



POWER STATION IN COURSE OF ERECTION.

THE huge power station which has been built at Chelsea for the Underground Electric Railways Co. of London, Ltd., is situated on the banks of the Thames at the point where the Chelsea Creek runs into the river, one side of the building adjoining the creek and the other side facing Lot's Road.

The following particulars of the materials used will give some idea of the magnitude of the work :—

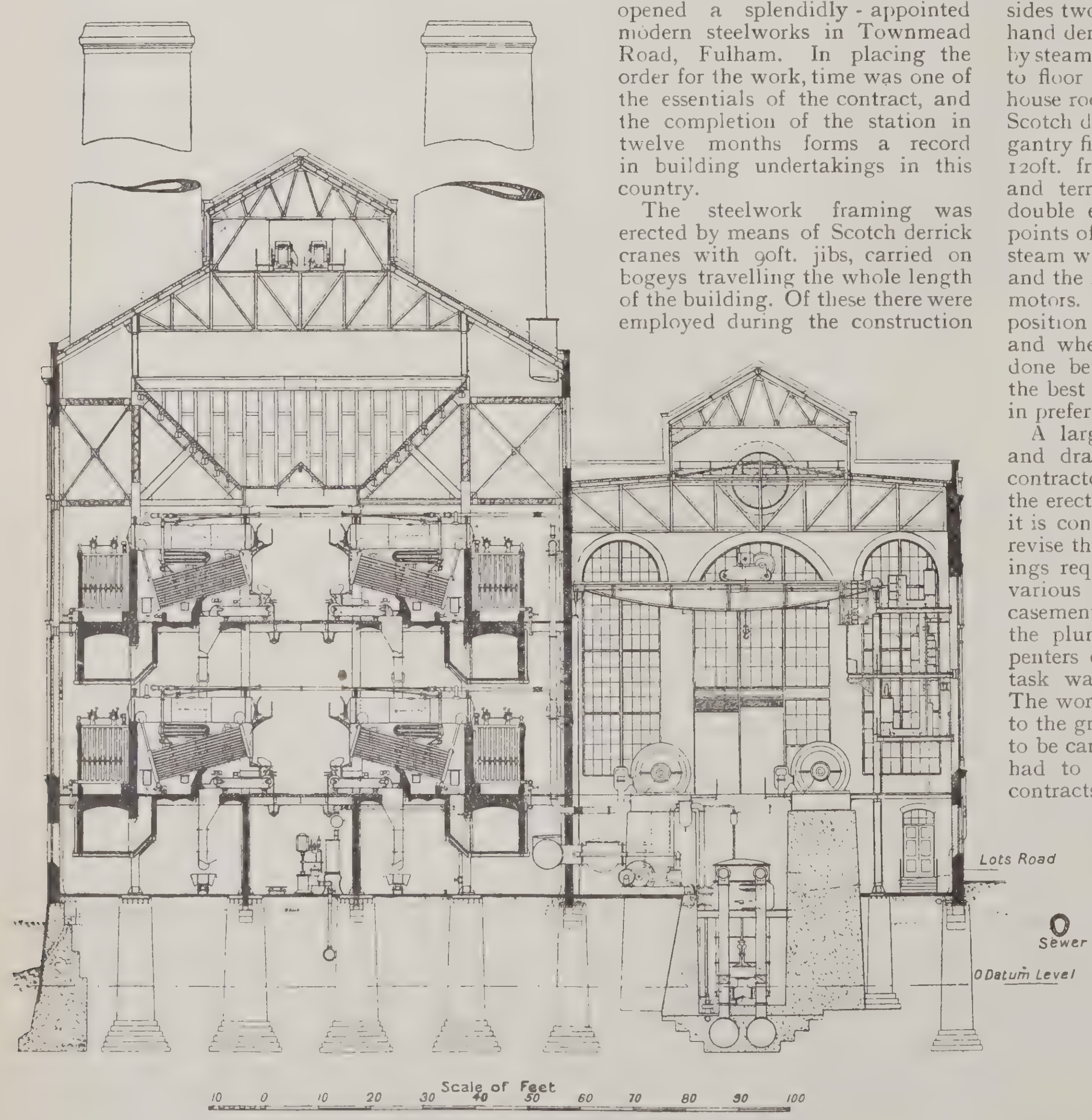
Fletton bricks - - - - -	6 millions.
Terra-cotta in string-courses, arches, cornices, &c. - - - - -	17,000 cub. ft.
Special-made arch bricks, all of different patterns - - - -	85,000
Red pressed facing bricks - -	85,000
Portland cement - - - -	600 tons.
Hydraulic lime - - - - -	260 ,,
Paint - - - - - - -	25 ,,
Steelwork in framing and structure -	6,000 ,,
Sundry steel and iron work not included in main structure - -	2,000 ,,

Brickwork commenced - - -	June, 1903.
,, finished - - - -	March, 1904.
Steelwork commenced - - -	May, 1903.
,, finished - - - -	December, 1904.

The building is 454ft. long by 175ft. wide, and the height to the ridge of the boiler-house roof is 145ft. The huge chimneys, 275ft. high (see centre plate), form a landmark visible all over London and for miles around. The building is of the steel-frame type, the entire weight of the structure and the internal fittings being carried by the steelwork, the brickwork simply forming the casing. The contract for the superstructure was placed with Messrs. Mayoh & Haley, who have had special experience in the erection of steelwork and who have recently opened a splendidly-appointed modern steelworks in Townmead Road, Fulham. In placing the order for the work, time was one of the essentials of the contract, and the completion of the station in twelve months forms a record in building undertakings in this country.

The steelwork framing was erected by means of Scotch derrick cranes with 90ft. jibs, carried on bogeys travelling the whole length of the building. Of these there were employed during the construction two 7-ton and four 5-ton steam derricks, besides two 3-ton, two 2-ton and several smaller hand derricks. These were fed with material by steam loco cranes, and were raised from floor to floor as the framing grew. The boiler-house roof was fixed by means of two 3-ton Scotch derrick cranes carried on a travelling gantry fixed on the top of the coal bunkers 120ft. from the ground. The bricklayers and terra-cotta fixers were served by four double electric cage hoists fixed at various points of the building. There were also four steam winches for hoisting sundry materials, and the mortar mills were driven by electric motors. The riveting of the steelwork in position was done by pneumatic hammers, and wherever work of any kind could be done better or more rapidly by machinery the best modern power appliances were used in preference to hand labour.

A large staff of highly-trained engineers and draughtsmen was maintained by the contractors to accurately set out and supervize the erection of the superstructure, and when it is considered that they had to check and revise the enormous number of detail drawings required by the manufacturers for the various special bricks, terra-cotta blocks, casements, rainwater pipes, &c., as well as the plumbers, glaziers, bricklayers and carpenters employed, it will be seen that their task was an onerous and responsible one. The work was exceptionally difficult owing to the great heights at which parts of it had to be carried out, and the fact that provision had to be made for a number of separate contracts to be carried out at the same time without interfering with each other in order that the whole building might be completed within the wonderfully short period of twelve months. It was no small undertaking to so organize the supplies to a huge contract like this that everything should be delivered at the time it was required; and as a large proportion of the special materials had to be manufactured in a shorter time than English makers had ever been accustomed to consider possible, the difficulties in this respect were very great.



POWER STATION, LOT'S ROAD, CHELSEA: TRANSVERSE SECTION.

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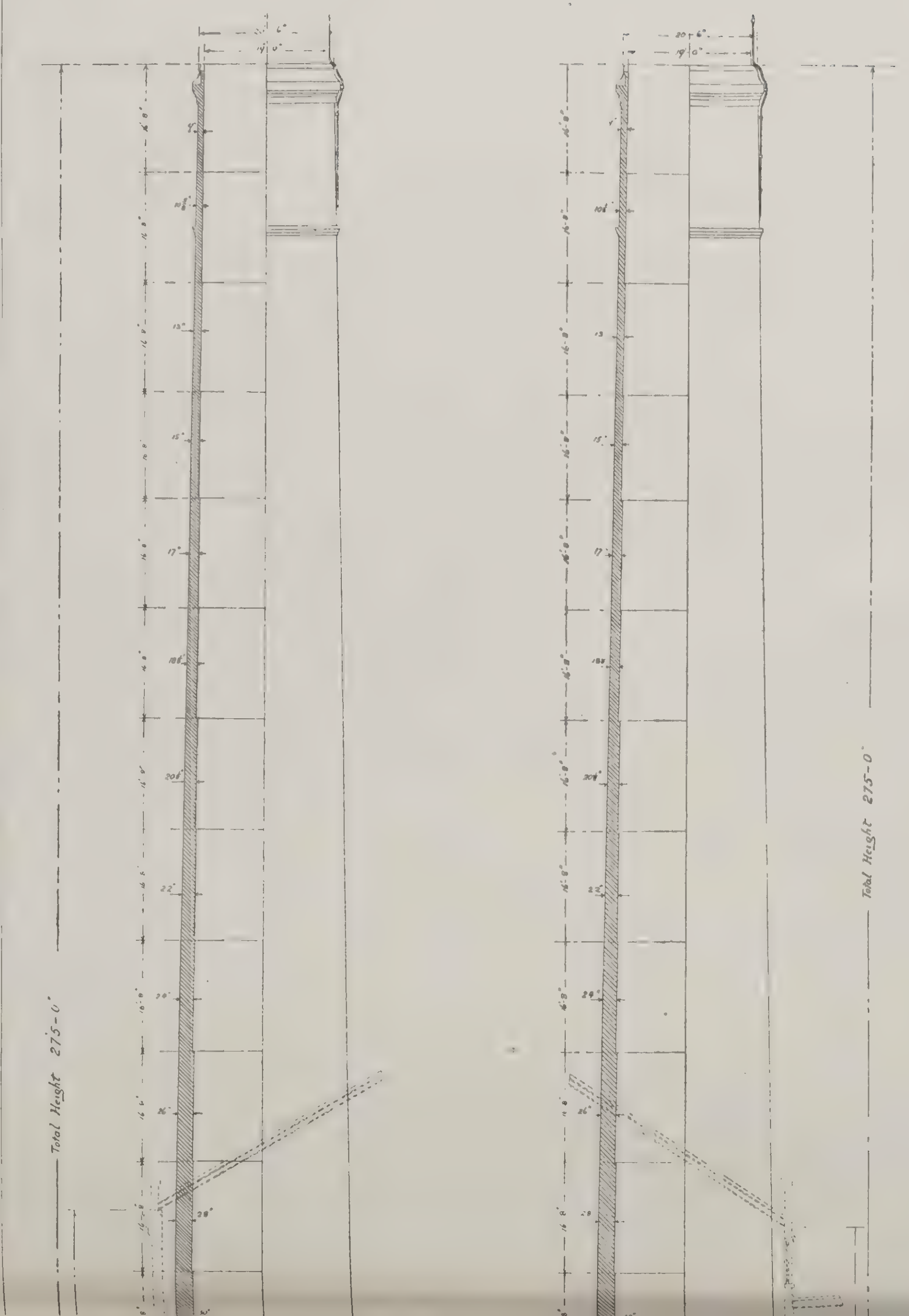
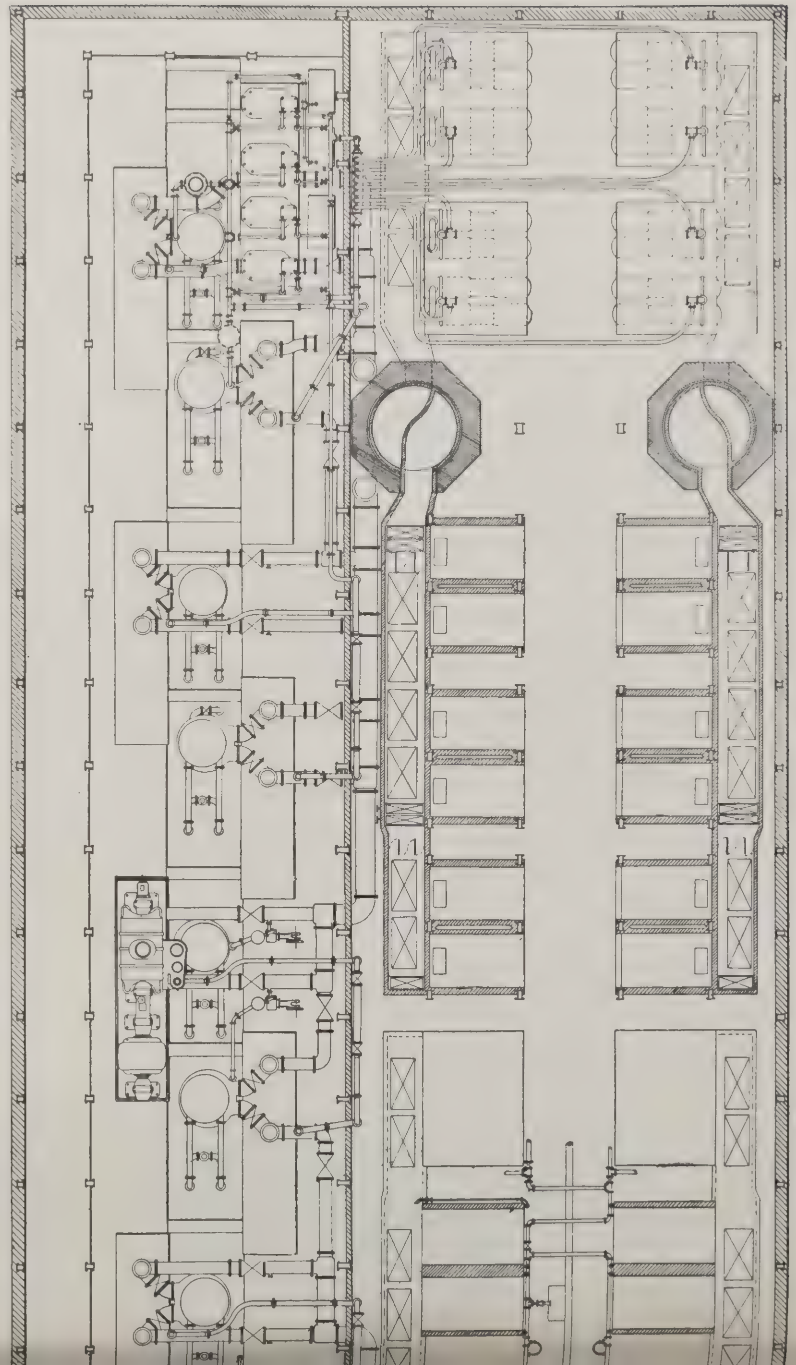
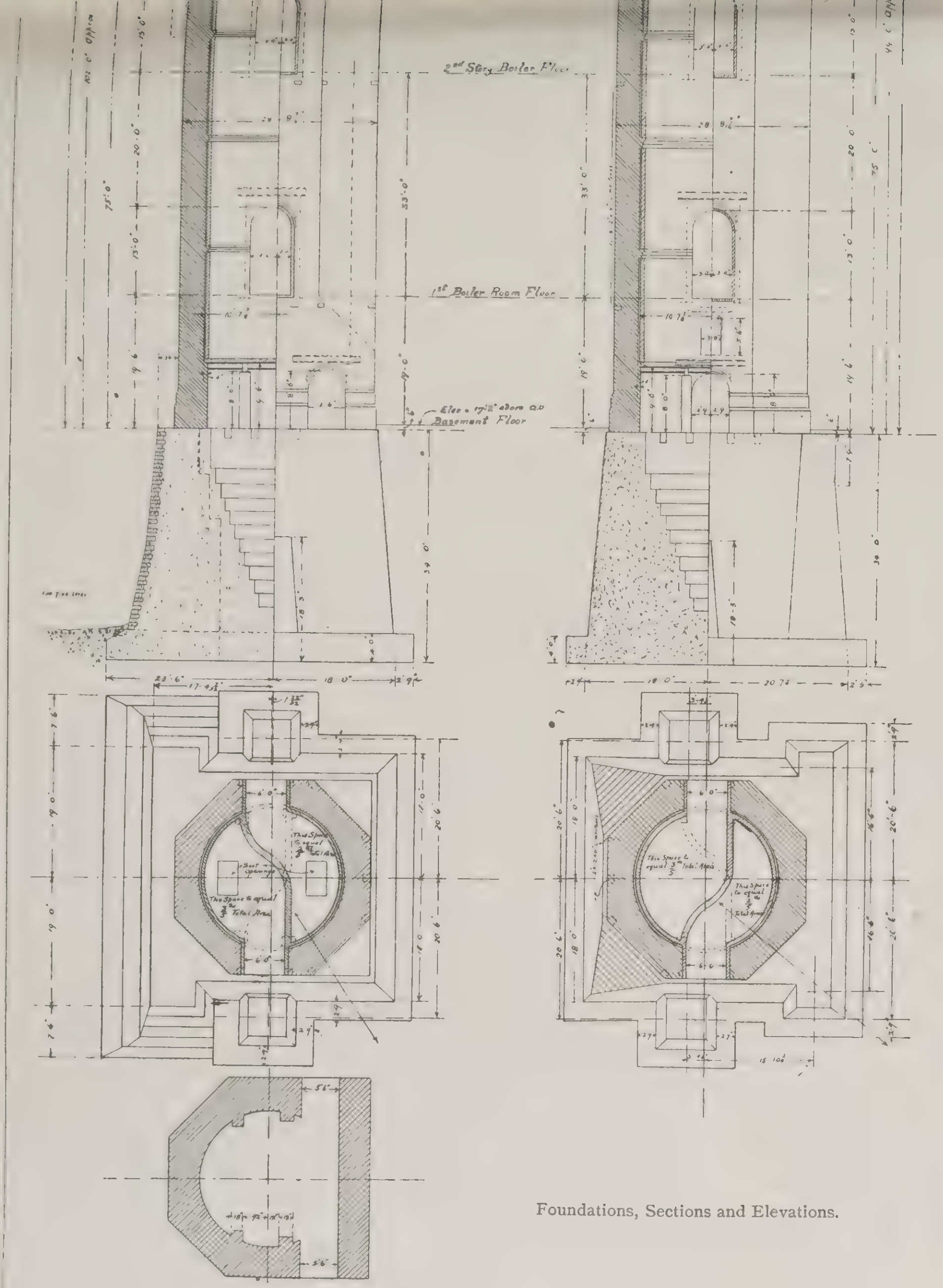
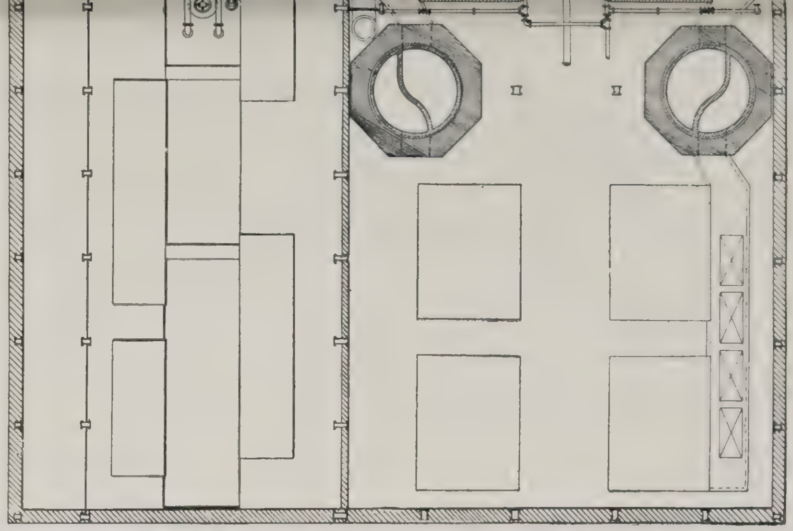


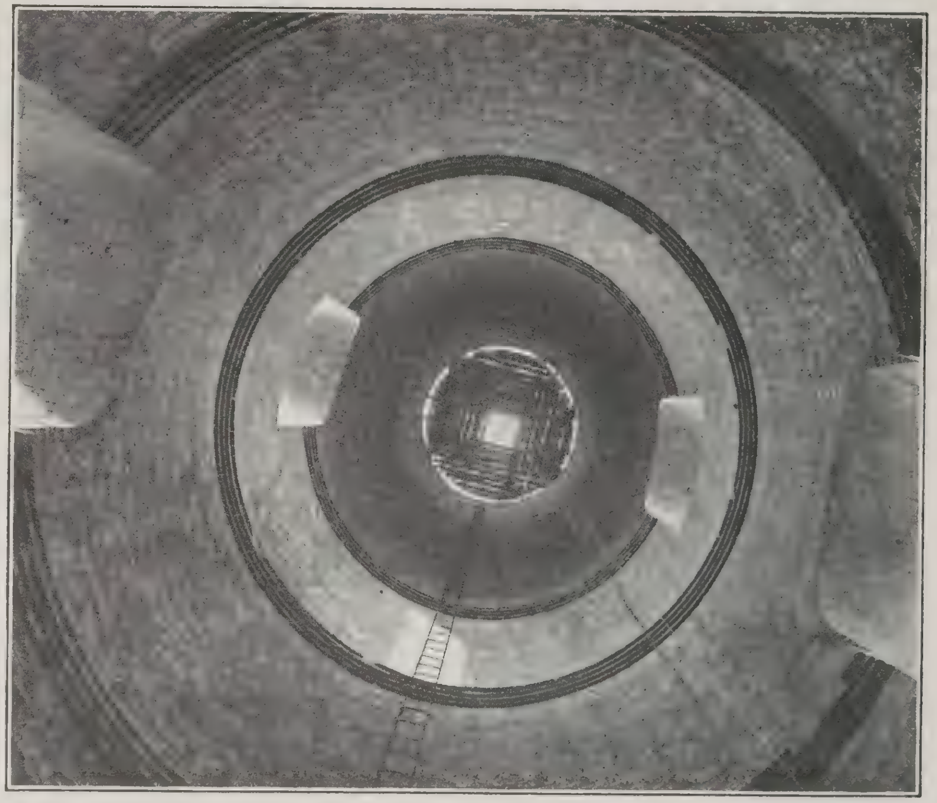


Plan of Station, showing Positions of Chimneys.



Foundations, Sections and Elevations.





View looking up Chimney in course of Erection.

CHIMNEYS AT THE GENERATING STATION OF THE UNDERGROUND ELECTRIC RAILWAYS CO. OF LONDON, LTD., LOT'S ROAD. CHELSEA.

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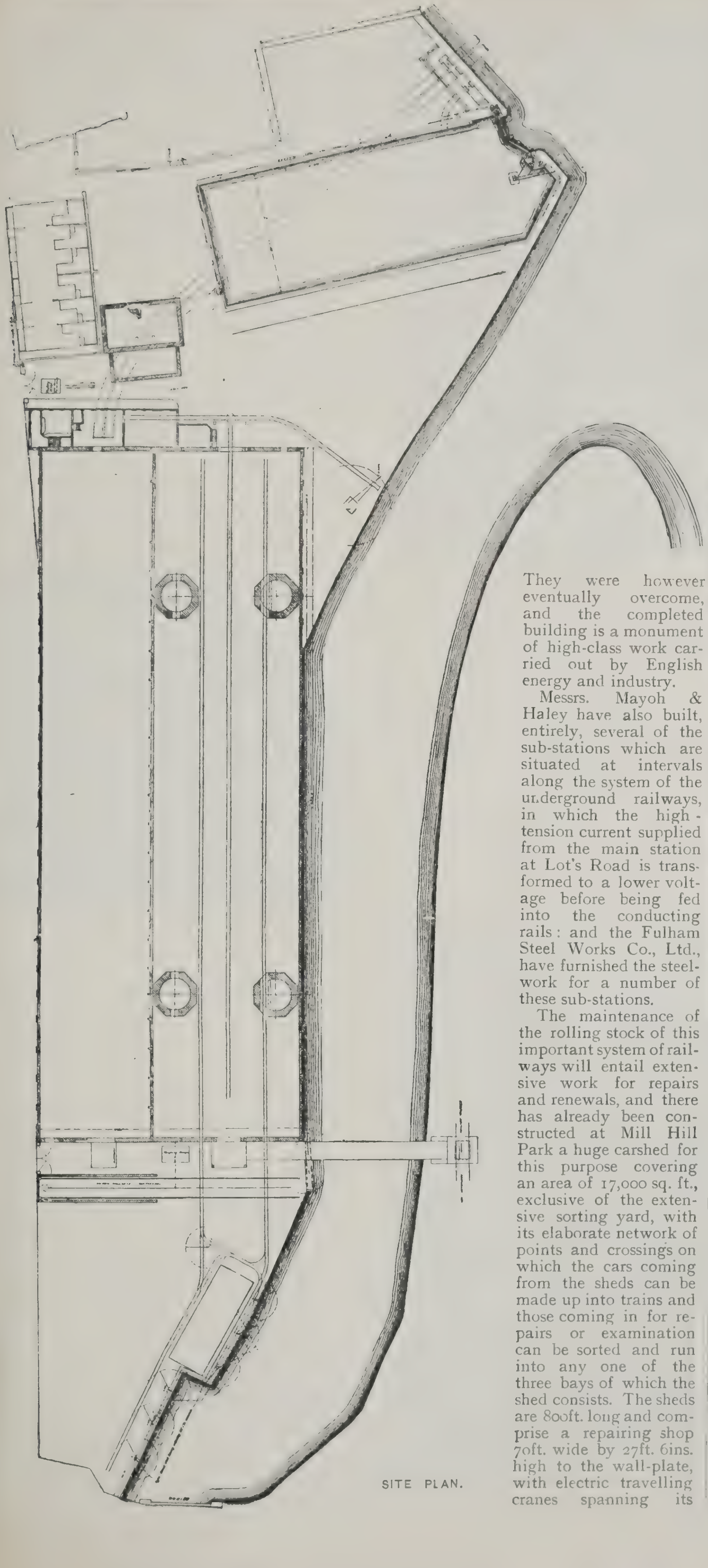


SITE PLAN.

They were however eventually overcome, and the completed building is a monument of high-class work carried out by English energy and industry.

Messrs. Mayoh & Haley have also built, entirely, several of the sub-stations which are situated at intervals along the system of the underground railways, in which the high-tension current supplied from the main station at Lot's Road is transformed to a lower voltage before being fed into the conducting rails: and the Fulham Steel Works Co., Ltd., have furnished the steelwork for a number of these sub-stations.

The maintenance of the rolling stock of this important system of railways will entail extensive work for repairs and renewals, and there has already been constructed at Mill Hill Park a huge carshed for this purpose covering an area of 17,000 sq. ft., exclusive of the extensive sorting yard, with its elaborate network of points and crossings on which the cars coming from the sheds can be made up into trains and those coming in for repairs or examination can be sorted and run into any one of the three bays of which the shed consists. The sheds are 800ft. long and comprise a repairing shop 70ft. wide by 27ft. 6ins. high to the wall-plate, with electric travelling cranes spanning its width and running the whole length of the carshed and paint shop, each 70ft. wide and 18ft. high to the wall-plate.

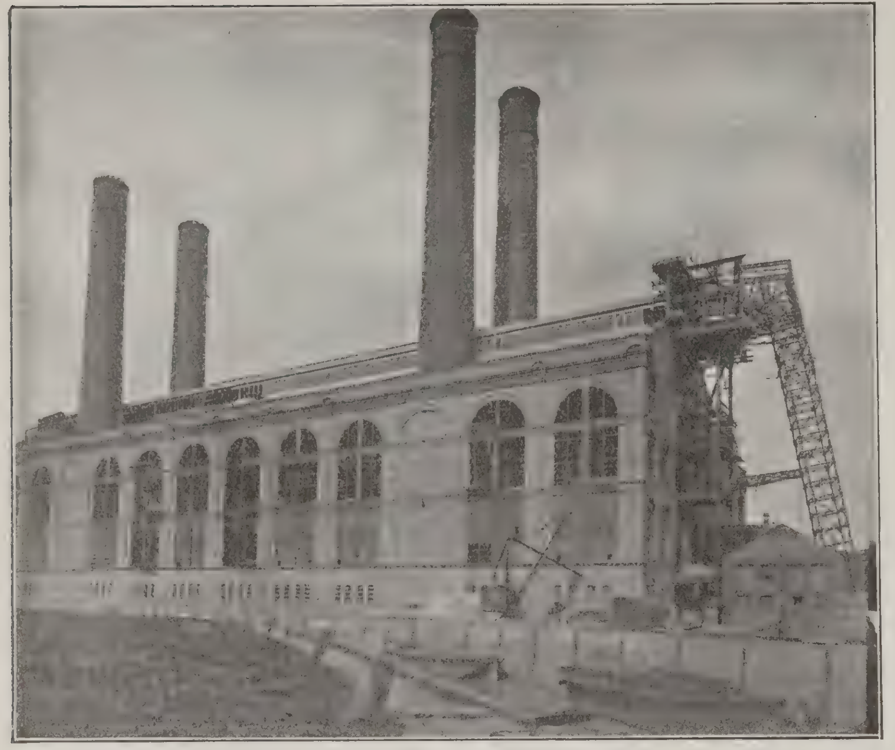
The whole of the steelwork for these sheds, also erected by Messrs. Mayoh & Haley and manufactured at the Fulham Steel Works, comprises more than 1,000 tons in the roof principals and stanchions alone, exclusive of a large quantity of miscellaneous work included in the lantern lights for roofs, offices, stores, &c. joists for supporting shafting, and a system of overhead runways for serving the various machines, as well as the whole of the points and crossings for the yard. The roof consists of forty-nine framed steel principals in each bay, with steel joist purlins supported on latticed stanchions, and covered with galvanized corrugated sheeting and glass. The steelwork was delivered on the site in sections, sorted, assembled, riveted together and stacked in position for the steam cranes which were to convey it into place, and it was erected by means of two steam derrick cranes travelling on bogeys the length of the building as the work proceeded. The whole erection was completed in July, 1904.

Electric trains have been running upon the Baker Street and Uxbridge extension of the Metropolitan Railway since January 1st, and it is hoped that the whole system will be in use this summer. It should be explained that the Chelsea station, here illustrated, will supply the current for the "District" railway and for the various "tubes" which are being constructed by the Underground Electric Railways Co. of London, Ltd., while power for the "Metropolitan" system will be supplied from the new station at Neasden.

The electrical capacity of the Chelsea station is stated to be 57,000 kilowatts at normal load. There are four powerful exciter-sets or dynamos and eight main-generating sets. The latter are three-phase alternators, built to generate 11,000 volts across each phase, and are driven by horizontal turbines running at a thousand revolutions per minute. There are sixty-four boilers two storeys high, arranged in groups of eight, each group being designed to supply the steam for one main-generating set. The water-supply is ample, and a siding of the West London Railway is close at hand so that truck coal can be easily manipulated. All the machinery for handling the coal is worked by electricity. The high-tension cables are carried in sixty-four ducts to a point on the Metropolitan District Railway at Earl's Court, where they separate for the sub-stations. The whole of this feeder system is in duplicate, as a protection against breakdown. Both at Chelsea and Neasden the turbine generators have been built by the British Westinghouse Electric and Manufacturing Co., Ltd. At the sub-stations the current is reduced by static transformers from 11,000 to about 440 volts and converted to continuous current at about 600 volts, at which it is conveyed to the conductor rails.

PROGRESS MADE WITH THE FIRST GARDEN CITY.

THE annual meeting of shareholders in the First Garden City (which is being erected between Hitchin and Baldock) was held last Thursday. In the report, which covered the whole eighteen months of the company's existence, it was stated that the total outlay on the estate was about £20,000, in addition to £9,177 repaid to mortgagees and other persons. Thirty-six houses, representing a capital value of £12,000, were built or being built, and arrangements had been made to spend £20,000 more in similar work. The company itself, however, was not erecting houses. The waterworks, including the pumping station and reservoir, were now in operation, and about five miles of mains had been



GENERAL VIEW OF POWER STATION, LOT'S ROAD, CHELSEA.

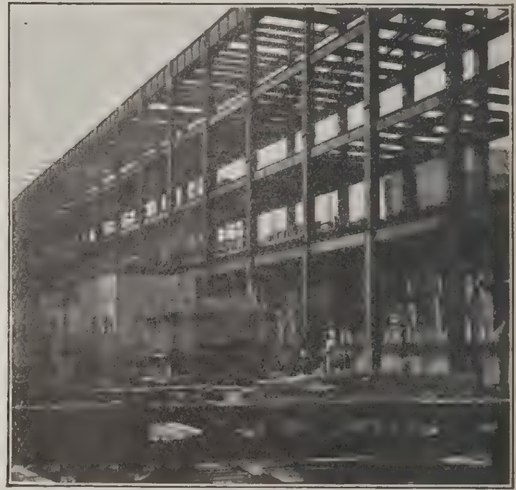
laid. About two miles of sewerage had been constructed from Letchworth along the Baldock and North Roads, and from the station to the factory sites. The directors were convinced of the desirability of both gas and electricity, but had decided to begin with gas, the works to produce which would probably be ready by June 30th. More than three miles of road had been or were being made, throwing 300 acres open to building. A siding for goods wagons had been constructed and was already being extended. The passenger station in the middle of the estate had been used only occasionally, but arrangements were being made with the Great Northern Railway Co. to open it for regular traffic in April, and plans for additional station buildings were being prepared. Five firms of manufacturers had agreed to take land, and applications had been received from others. The question of providing further educational facilities was under consideration, and steps were being taken to erect a public hall. An exhibition of cheap cottages would be held on the estate from July to September. In compliance with the wishes of the great majority of shareholders, the First Garden City would henceforth be called Letchworth.

With regard to the exhibition of cheap cottages it may be stated that up to the present sites for about forty cottages have been definitely applied for, and many more intentions to build have been expressed. It is intended to offer prizes not only for the best £150 cottage, but also for the best plans and designs of suitable houses, as well as novel building materials, and such fittings as kitchen ranges, baths, coppers, &c. Any inventor will also be able to erect cottages on the non-permanent site in the exhibition, and arrangements have been made for the financing - up to 90 per cent. of the cost—of buildings erected on the permanent site, the plans of which must, however, be first approved by the First Garden City (Ltd.).

L.B.A. AMENDMENT BILL.

Further Opposition.

At a conference of delegates from twenty - two metropolitan local authorities held last week at the Westminster Palace Hotel, the following resolutions were passed: (1) "That the provisions of the London Building Acts Amendment Bill are of such a drastic and complex character, and if passed into law would be found so unintelligible and unworkable, that it is desirable that the Bill should be withdrawn or opposed." (2) "That, inasmuch as the London Building Act of 1894 is already complicated by the amendments of the Act of 1898, this conference is of opinion that a new Building Act for London, codifying the present law, should be formulated, and that before the Bill is drafted the views of the London County Council, the Corporation of the City of London, the councils of the City of Westminster and the several metropolitan boroughs, and the various professional associations connected with building work, should be ascertained and considered, and that, in the opinion of this meeting, a Royal Commission should be appointed to take evidence accordingly and to report on the whole question, with a view to the drafting of a Bill codifying and amending the London Building Acts." (3) "That in any new measure the London County Council should be relieved as much as possible by transferring to the City and borough councils of all duties that can be efficiently discharged by those bodies in accordance with the views expressed by the Royal Commission in 1894."—On Wednesday last the Incorporated Association for the Protection of Property Owners resolved "that the Bill should be opposed at every stage in Parliament," and on Friday the council of the London Chamber of Commerce decided to lodge a petition against the Bill. The Royal Institute of British Architects also protest against the general form and conditions of the Bill.—The articles on the Bill which appeared in the "City Press" (148 and 149, Aldersgate Street, E.C.) have been re-issued in pamphlet form, price 2d.



CONDITION OF WORK, SEPTEMBER 16TH, 1903.

INTERIOR OF ENGINE HOUSE, SHOWING TURBO-GENERATORS.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Factory and Workshop Inspectors.

WESTFIELD.—W. N. G. writes: "Please give some particulars in regard to the appointment of inspectors under the Factory and Workshop Acts. Are any examinations held?"

It is necessary to obtain a nomination from the Home Secretary through the local M.P. or some other source. An examination has then to be passed when a vacancy occurs, the following being the subjects:—(1) English composition, (2) arithmetic, (3) sanitary science as applied to factories and workshops, (4) law relating to factories and workshops, (5) elementary physics and mechanics, (6) history of industrial and social legislation in the United Kingdom, (7) chemistry, (8) mechanism. Supposing the syllabus to be unaltered, the following books might be studied:—(1) Nesfield's "Manual of English Grammar and Composition" (2s. 6d.); (2) any good elementary arithmetic; (3) Maxwell's "Warming and Ventilation" (2s.); (4) Maxwell's "Drainage and Sanitary Fittings" (1s.); (5) Reid's "Practical Sanitation" (6s.); (6) First "Department Report on Ventilation of Factories and Workshops" (1s. 8d.); (7) Austin's "Law relating to Factories and Workshops" (7s. 6d.); (8) Williams and Musgrave's "Factory and Workshop Act, 1901" (3s. 6d. nett); (9) Taylor's "Theoretical Mechanics, including Hydrostatics and Pneumatics" (2s. 6d.); (10) Henderson's "Elementary Physics" (2s. 6d.); and if chemistry be the special subject selected, (11) Roscoe and Lunt's "Inorganic Chemistry for Beginners" (2s. 6d.), followed by (12) Roscoe and Hannen's "Inorganic Chemistry Advanced" (4s. 6d.); or if mechanism be the special subject, (13) Low's "Introduction to Machine Drawing and Design" (2s. 6d.), (14) Unwin's "Elements of Machine Design" (Part I. 7s. 6d., Part II. 6s.), or other textbooks recommended by the class teacher. This course ought to occupy twelve months' close study, unless you have already made some advance in the various subjects. The examination would probably be held in London. HENRY ADAMS.

[The books named above can be obtained post free from our offices at the prices given.]

Drain or Sewer.

LEYTON.—MATERIAL DIFFERENCE writes: "The plans at the town hall show a drain which is part of a combined system to run within 1ft. of the right-hand side of a house (within the metropolis), whereas as actually laid the drain runs within a foot of the left-hand side—a difference of about 13ft. or 14ft. As the town hall plan is clearly wrong, does it not make the drain a sewer within the meaning of the Act? Could it be reasonably maintained that it makes no material difference, seeing that to reconstruct the drain it is necessary, as the drain is actually laid, to excavate about 30ft. additional under the kitchen and scullery; whereas if it had been laid as ordered by the plans of the town hall it would have been laid outside these rooms and would merely have gone under the flooring of the back and front parlours?"

We do not understand what you mean by the "town hall plan"; is this a plan deposited for approval, or a plan prepared for the borough engineer for his own information and use. Further, what do you mean by combined system? Is this house one of several discharging sewage into a common drain; or by "combined" do you mean that the sewage and rainwater from the house both discharge into a common drain? The inaccuracy of any plan prepared by the borough engineer would not affect the question.

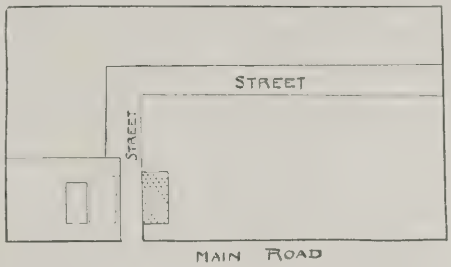
Cost of Schools.

WREXHAM.—SCHOLASTIC writes: "What is a reasonable price per ft. cube for ordinary one-storey central hall elementary schools?"

About 8d. per ft. cube would be a reasonable figure.

New Streets.

LEICESTER.—H. A. writes: "At one corner of a large field is a house of which I have been the owner for twenty years. The ground was bought out of the field about 100 years ago. Lately the owners of the field sold it to a man who made a street in front of my house and is selling the land for building purposes. Opposite my house a man has built a house and only left about 13ft. for the street. I now desire to build another house in front of my old one, but the council will not pass the plans because the new street is not wide enough. They do not want to purchase the ground from me to complete the street. They are just trying to bustle me out of it. What action should I take?"



There seems to have been some sharp practice, and you should have taken action before. But you cannot be prevented from building on this plot provided you make your house and the entrance to it face the main road. Your case is analogous to that of *St. George's Local Board* v. *Ballard*, decided in the Court of Appeal on February 26th, 1895. There was a passage about 176ft. long and 8ft. wide running out of a main road having on one side a row of cottages and on the other side gardens belonging to the cottages. Defendant, Ballard, purchased these gardens and began to build thereon three houses fronting not on the passage but on the main road. The wall of the end house next the passage extended about 40ft. up the passage, and the wall of its garden extended 40ft. further. The local board contended that defendant was laying-out the passage as a new street and could be compelled to widen it to the extent required by the by-laws. Judgment was given for the defendant on the ground that what defendant had done did not amount to laying-out or constructing a new street. The appeal of the local board against this decision was dismissed on the ground that *there was no evidence of any intention to build houses fronting the passage.* You will have to take proceedings to compel the council to pass the plans, or challenge them to take proceedings by commencing to build the house. On this you should take legal advice.

NORTHAMPTON.—ROAD writes: "(1) Can A and B (being owners of land approached from an occupation road 18ft. to 24ft. wide, and being partly responsible for keeping it in repair) prevent C from forming a new street 36ft. wide out of the occupation road? (2) Can C give purchasers of plots adjoining the new street right of access, both foot and cart, over the occupation road (there is at present a public footpath over same), and if so, would any liability rest on the purchasers as to the repair of the occupation road? (3) Can the local council object to the proposed new road owing to the width of the occupation road (which is the only approach to the new road)? (4) Can the local council refuse to take over the road when properly formed owing to the absence of access to it (the occupation road not being a public road repairable by the local authority)?"

(1) They can prevent vehicular traffic; the footpath still remains. A and B cannot prevent C constructing a new road on his own land. (2) Doubtful whether more than the footpath rights exist. (3) Yes; but it depends on the by-laws in force. (4) Yes.

Sanitary Examinations.

LIVERPOOL.—T. E. M. writes: "Which is the more valuable, the examination of the Royal Sanitary Institute or that of the Institute of Sanitary Engineers? Does the latter's certificate cover the M.S.I. certificate of the former, or *vice versa*? Does the certificate of inspector of nuisances of the R.S.I. cover the certificate of the Institute of Sanitary Engineers?"

The two institutions are entirely separate and distinct, and their examinations and certificates have no bearing on one another. The Royal Sanitary Institute was founded in 1876 and incorporated in 1888. It is now under Royal patronage, and is the better-known of the two institutions. The Institute of Sanitary Engineers was incorporated in 1895. We cannot decide for you in the matter. It would be best for you to write to the secretaries of both asking for particulars, so that you can judge which you would care to take up.

Road Surveyor in Partnership with Contractor.

CLEETHORPES.—G. C. writes: "I send a report of an examination wherein it is stated that a debtor had undertaken road-making for the urban district council of Cleethorpes in partnership with the council's surveyor. Can the latter enter into partnership with a road contractor and at the same time supervize the work of the contractor? What steps should I take as a ratepayer to bring the matter before the proper authority in the event of the local authority taking no action?"

It is very undesirable for a road surveyor to enter into partnership with a road contractor whose work he must control and supervize. Whether it is illegal is another question; it depends on the terms of the surveyor's agreement with the local authority. In the event of the council refusing to take action your course would be write to the secretary of the Local Government Board, Whitehall, London, S.W., stating fully and clearly all the circumstances, and sending documentary and other evidence if possible. If several other ratepayers joined you in signing this statement it would add weight. But you must be very sure of your facts.

Alterations or Erasions in Printed Forms of Contract.

ILLINGWORTH.—ANXIOUS writes: "In using printed or lithographed forms of contract, conditions and specifications, having portions erased, altered or scored out, is it necessary where these occur to have the same signed or initialled by the architect, contractor and employer? In 'Specification' No. 6, p. 195, clause 4 simply states in supplementary provisions to form of conditions: 'the contractor to examine the contents of these specifications, the printed portion as well as the written, as every word printed is to remain in full force unless it is erased or scored out by the architect or owner, before signing.' If not initialled, &c., who is to know by whose authority the same has been altered, and might not the omission invalidate the contract in the event of its coming before a judge?"

Yes, the alterations should be initialled by the contractor.

Stone used in Lancashire.

London.—H. A. C. writes: "What stones are used for facing work in and about Burnley, Lancashire?"

Appleton, Bolton Wood, Bramley Fall, Calverley Wood, Howley Park, Idle, New Leeds, Park Spring, Scott Hall, Spinkwell and Cliffwood are all within easy distance.

Architectural Drawing.

Brentford.—E. W. T. writes: "In Mr. Maurice B. Adams's' article on 'Drawing for Architects' in 'Specification' No. 7 I notice he recommends the student to obtain William Burges's folio of 'Architectural Drawings' and any volume of the London Architectural Association Sketch-Book. Can you give me any particulars of these, where they can be obtained and the price?"

For Burges's folio apply to Mr. B. T. Batsford, 94, High Holborn, W.C. The Architectural Association Sketch-Book can be obtained at the Association's offices, 18, Tufton Street, Westminster. The work is issued to subscribers only, the subscription being one guinea per volume.

Contracts.

Halifax.—T. S. writes: "If an employer asks for a contract to be lent to him and the architect objects (as holding same between employer and contractor), should the employer insist? Is the architect bound to lend it, or should the employer or the contractor demand a copy? Is the architect obliged to let either of them have a copy?—in which case, can the architect make a charge for same, and what would be a fair amount?"

The architect should keep the contract and provide copies, for which a charge can be made.

Timber Prices.

Dover.—W. H. G. writes: "Where can timber be obtained from time to time at the rates published in your columns?"

The timber prices given in our columns are—as the title above them indicates—"current market prices": that is to say, the prices of large quantities sold by auction at the docks. Naturally, for small quantities the prices will be higher.

Insufficiently Cooled Cement.

Hull.—A. G. writes: "Supposing that in order to save time it was found imperative to use insufficiently cooled cement (in the construction of an ordinary fireproof floor) what precautions would you adopt to obviate any possible defects?"

Mix with an excess of water and leave a space around the walls for expansion; but it is very risky to use "hot" cement.

Thickness of Walls.

Harringay.—H. writes: "The by-laws of an urban district council stipulate that walls of given length and height (less than three storeys) must be 14ins. thick at the base and 9ins. for the top storey. A house is designed with ground and first floors, and in the roof, above the wall-plate, a servant's bedroom and box-room. The local surveyor says this constitutes a storey, making three in all, and insists on walls being 14ins. everywhere. Is he right? If so, it is useless for the topmost storey to be 9ins. thick, as there is no brickwork."

In our opinion 14ins. for the ground storey and 9ins. above is quite sufficient for a three-storey house, but the surveyor is entitled to insist upon the extra thickness prescribed by the by-laws.

Ballroom on First Floor.

Newcross. — Candidate writes: "Please answer the following question, set at a recent examination: 'A ballroom 32ft. by 80ft. has to be constructed on the first floor, the ground floor being a solid heavy-brick structure without internal or cross walls or other supports. The room is to be constructed entirely of wood—floor, sides and roof; the roof to be open and unceiled, and the timbers of the sides may be shown inside as well as out. Draw $\frac{1}{2}$ transverse section and $\frac{1}{2}$ plan of one bay.'"

We cannot undertake to answer examination questions such as this. On more than one occasion we have stated that our Enquiry columns are not intended for such questions, but for matters arising in everyday work.

Measuring on Hill Face.

Berwick.—Dispute writes: "In fencing a piece of ground a part of it is on a very steep hill face. A dispute has arisen between the parties as to the proper mode of measuring this sloping portion. Should it be measured on the slope or on the horizontal?"

In all cases of measurement of land for the purpose of placing its dimensions upon a plan, and when buying and selling, &c., the horizontal measurements are employed, and a reference to any book on surveying will give you the reasons for this in detail. The only case in which the surface (sloping) measurements are taken is where labour (for instance, reaping, hoeing, &c.) is paid for.

F. S. I.

Assignment of Contract.

Gloucester.—J. F. T. writes: "In the contract form issued by the R.I.B.A. clause 19 reads as follows: 'The contractor shall not without the written consent of the architect assign this agreement or sublet any portion of the work.' What weight has this clause in the event of a builder failing or, assigning his estate to a trustee for the benefit of his creditors? Or, in the event of the builder assigning the contract to a particular creditor without the architect's consent, can the assignment be ignored by the architect?"

There is no doubt that the assignment by the contractor to a particular creditor constitutes a breach of clause 19 of the R.I.B.A. conditions, but I am of opinion that an assignment to the trustee in bankruptcy does not constitute such a breach. It is even doubtful whether forfeiture of contract can be enforced in case of the contractor's bankruptcy, although a special clause to that effect has been inserted in the contract. The trustee in bankruptcy has the right under section 55 of the Bankruptcy Act, 1883, to disclaim any unprofitable contract, but this does not necessarily prevent the employer from proceeding under clause 26 of the R.I.B.A. conditions.

F. S. I.

Strength of Concrete Steel Lintel.

Referring to the reply and enquiry under this head on p. 79 of our issue for last week, Mr. James A. Smyth (Cambridge) writes: "'Studio' is unconsciously playing with fire. He should know that the methods of calculation in concrete steel cannot be supplied *ad libitum*: even if they were, some knowledge of the subject would be needed before the formulæ could be used with perfect safety. Assuming that the actual load he mentions is really 11 tons, I find from mere inspection of the tables that at least an 18in. deep beam is required if the beams are 12ins. wide with about 2 square inches of steel reinforcement in the bottom; even then investigation should be made for shear on cross-sectional area of the beam against supports. The latest experiments carried out on beams of reinforced concrete have resulted in locating the neutral axis about $\frac{4}{10}$ths of the distance from the top of the beam to the centre of the steel for 1 per cent. of steel of high elastic limit, approximately only, on account of its varying position when under increments of loading. This position with other data enables the student following the subject closely to devise a formula in connection with the ascertained results. With regard to compression, 500 lbs. is an ordinary value assumed by many constructors. The subject will be found to be exceedingly complex to the ordinary person; and if he really wishes to study it fully, let him begin with Major Winn's 'Notes on Steel Concrete.'"

[*Note.*—In the reply given in our issue for last week, line 3, for "estimate" read "concrete."]

Gallery Cantilever.

We have received the following criticisms of Professor Adams's reply to the enquiry on the above subject published on p. 79 of our issue for last week:—

J. B.—"The solution given does not appear convincing. One might suggest a simpler solution, thus:—Taking moments about the column, and remembering that the distance is 11ft. between the centre of column and the centre of bearing on wall,

6 tons × 10ft. = 4 tons × 5ft. + w tons, the weight of wall × 11ft.

3 636 tons = w, which is the weight of wall to counterbalance the upward pull of the cantilever.

The weight on the column is
= 6 + 4 + 3·636
= 13·636 tons."

K. P.—"I was asked the same question some six months ago, but obtained a slightly different result. The only point doubtful with me is the horizontal portion and the weight of 4 tons. Professor Adams apparently assumes part of this weight of 4 tons to be carried by the wall and part by the column, thus making the moment due to this load acting around the column cap as a fulcrum, zero. But should not the whole of the 4 tons be considered as acting in the opposite direction to the 6 tons, since the 6 tons, being the larger (but for the anchorage), would draw it upwards, thus relieving the wall of all weight? I arrived at the following result, taking the point above the column as fulcrum:—

Moment of projecting portion = 10 × 6 = 60ft. tons.
Moment of horizontal portion in opposite direction 4 × 5 = 20ft. „
Difference = moment to be obtained by anchorage = 40ft. „

Taking the point of anchorage as 11ft. distant, the anchorage would be $\frac{40}{11}$ = 4 tons nearly. Therefore the weight on the column = 6 + 4 + 4 = 14 tons.

I offer this solution with all diffidence, as somehow or other I feel Professor Adams may prove himself correct."

[Professor Adams will doubtless reply in our next issue.—Ed. B. J.]

Duplicating Quantities.

Timperley.—Mahogany writes: "Is there on the market any appliance to take copies (4 to 6) of ordinary quantities as supplied to builders which are usually lithographed or typewritten?"

Duplicates could be taken on "blue prints" if the original were written on thin paper, or they could be taken by one of the several duplicating processes. Full particulars of the former will be found in our issue for August 31st last and of the latter on p. 354 of the issue for July 29th, 1903.

THE TIMBER TRADE.

London Market in January.

THE first month's consumption of wood in London was disappointing, showing a shrinkage of 2,800 standards in comparison with the small deliveries of January, 1904. A glance at the figures will show the stock to be a light one, but really ample to meet the reduced demand upon it. A large and active business was concluded during the month for arrival next spring and early summer. Both Swedish and Russian shippers have sold freely, and buyers have operated (especially in Russian stocks) with a confidence which is rather at variance with the complaints of bad trade and poor consumption which are heard on all sides. In the opinion of Messrs. Churchill & Sim the reasons for buyers' action are twofold, namely, the moderate prices at which good specifications can be secured, and a confidence that the general trade of the country is likely to improve in the near future, which is bound by degrees to affect the consumption of wood. The present activity seems, therefore, to be the outcome of anticipation of the future rather than a reflection of present conditions, and the progress of consumption will need very careful watching in forming an estimate of the probable course of the market. Freights remain cheap, with plenty of tonnage offering.

Messrs. Denny, Mott & Dickson state that the new year opened with a general feeling that the cost of material could not go lower, and there has been a well-defined movement to enter into large forward contracts for soft woods at the low level of prices ruling at the end of last year. Prices for forward supplies have, therefore, distinctly hardened; but the demand for consumption has shown little reliable indication of expansion. The present floating tonnage is very ample, even though the volume of trade shows a distinct improvement on that of last year.

The abstract of stock, consumption, &c., for January, published by Messrs. Foy, Morgan & Co., is given in the table at the foot of this page.

Dock Stocks in January.

The stock of wood in the public docks of London on January 31st was as follows:—

	Pieces.
Foreign deals and ends - - -	1,916,000
Do. battens - - - -	2,929,000
Pine deals and battens - - -	1,222,000
Spruce do. do. - - -	1,220,000
Boards, rough - - - -	4,200,000
do. prepared - - -	8,179,000

Totalling 19,666,000 pieces, as compared with 23,125,000 in 1904, 20,321,000 in 1903 and 20,876,000 in 1902.

In other kinds the stock was as follows:—

Foreign wainscot logs - -	434 pieces.
Do oak timber - - -	855 loads.
Do. fir timber - - -	1,212 do.
Colonial oak timber - - -	1,510 do.
Do. birch timber and planks -	2,461 do.
Do. elm and ash timber -	938 do.
Do. yellow pine - - -	517 do.
Do. red pine - - -	243 do.
United States pitch-pine timber -	21,228 do.
Do. do. deals -	55,000 pieces.
East India teak - - -	7,670 loads.

The Deliveries for January

have been of—

	Pieces.
Foreign deals and ends - - -	287,000
Do. battens - - - -	451,000
Pine deals and battens - - -	85,000
Spruce do. do. - - -	105,000
Boards, rough - - - -	562,000
do. prepared - - -	1,086,000

Totalling 2,576,000 pieces, as compared with 2,774,000 in 1904, 3,316,000 in 1903 and 3,303,000 in 1902, or in cubical contents:—

	Jan. 1905.	Jan. 1904.	Jan. 1903.	Jan. 1902.
	P.s.h.	P.s.h.	P.s.h.	P.s.h.
Sawn wood -	11,276	12,557	14,285	16,130
Prepared boards	3,482	3,912	4,756	4,670
	Loads.	Loads.	Loads.	Loads.
Timber - -	5,194	6,356	5,100	8,389

Deliveries to Craft.

Deliveries direct from ship to craft were—

	Jan. 1905.	Jan. 1904.	Jan. 1903.	Jan. 1902.
	P.s.h.	P.s.h.	P.s.h.	P.s.h.
Deals and battens -	1,634	2,632	1,930	2,363
Boards - -	394	402	679	580

Soft Woods.

Messrs. Churchill & Sim state that the Swedish market has been an unprofitable one, and prices were barely maintained in January except for parcels of battens and scantlings landed in good condition under cover, for which, whenever a demand showed itself, rather more remunerative prices were obtainable. Prepared boards showed distinct weakness on the whole, in spite of the short stock, but a moderate improvement of the demand is all that is wanted to put them back to the autumn level of prices, and possibly a shade beyond it.

The importation of floorings from Norway has only been a normal one, but in consequence of reduced requirements prices have fallen during the month. The stock is not by any means excessive, and any fair improvement in the demand would soon bring them up a point or two.

Russian deals have commanded profitable prices to importers, and the stock of parcels of reliable quality is not at all excessive. The free-on-board market has been active, and many stocks are practically cleared for f.o.w. delivery. Any attempt, however, to raise values has been met by importers with indifference owing to the poor consumption in this country, and to the fact that the demand will have to improve considerably if they are to come into the market again later.

A little hardening of the prices obtainable here for Finnish battens and scantlings is just perceptible. A large business has been concluded for delivery ahead at moderate prices which have tempted buyers to operate. The stock is not excessive, especially in scantling sizes.

There was no importation of Prussian timber into London in January. Prices for delivery have reached such a high level that the timber has been replaced as a regular market wood by sawn pitch-pine timber, and the importation of it is almost exclusively for special works and railway contracts.

January brought with it no improvement in the demand for Canadian pine deals, of which the stock in London is quite a full one. A quantity of first pine was sold at auction during the month at prices quite out of keeping with high rates current on the other side, but the quality of some parcels left much to be desired. Spruce deals showed here and there some little improvement towards the end of the month, but the opportunities for easily acquiring cheap stock from New Brunswick at short notice have militated against any hardening in the value of regular third- and fourth-quality deals. The only importation during the month was a fair quantity from that district, which met with a good demand on account of the very low prices at which it could be secured. The stock of sawn timber from the pitch-pine ports was added to by one cargo during the month, but the consumption does not improve. The only hope for a more active market is the fact that prices ahead have stiffened very considerably, and that this improvement is the result of a genuine home demand in the States, and the large and apparently increasing requirements of other countries outside Europe. Deals are selling at better prices owing to the increased cost of replacing them.

Hardwoods.

Teak.—Messrs. Denny, Mott & Dickson report that the landings in the London docks during January consisted of a total of 356 loads, as against 883 loads for January, 1904. The deliveries into consumption were 1,255 and 790 loads respectively. Figures show a continuous falling off in supplies and the consequent inconvenient shrinkage of stocks, which are not only very unduly small but of a specification too poor to satisfactorily meet the requirements of consumers. Prices continue to rise in consequence, and business is of a necessarily restricted character, as even high prices cannot increase the volume of supply if the cry of *non possemus* is genuine, as the state of shipments seem to prove it to be.

Mahogany.—Messrs. Denny, Mott & Dickson state that the market has been very quiet, but prices have well held their own, as in face of the modest imports the demand has been adequate, if not brisk. Messrs. C. Leary & Co. report that they had two public auctions during the last fortnight of January, at both of which the results were satisfactory.

Odessa Oak.—The enquiries for forward supplies continue to be encouraging; but in view of the possible interruption to business which may be caused by the political turmoil in Russia, shippers are careful in committing themselves to fresh business. Stocks on this side are all but exhausted, and the available supplies ready for shipment are already sold.

American Oak.—The demand for quartered is weak and prices are low; Messrs. Leary quote from 2s. 6d. to 4s. 9d. per cub. ft. The arrivals of plain planks are moderate and prices firmer; there is a regular business in first-quality boards, with a small enquiry for medium grade: values range from 1s. 3d. to 2s. 9d. per cub. ft.

American Whitewood.—The tone for lumber is rather dull, the chief enquiry being for first and medium qualities; quotations are 2s. 3d. to 3s. 6d. per cub. ft. for first quality, 1s. 9d. to 2s. for clear saps, 1s. 6d. to 1s. 9d. for medium, 1s. to 1s. 3d. for culls.

Italian Walnut.—The stocks, which were already more than sufficient, have been further increased; only prime planks, wide and thick, are likely to yield satisfactory results; for such quotations are 6d. to 7½d. per ft.

ABSTRACT OF STOCK, CONSUMPTION, &C., FOR JANUARY.

S.C. Dks. and M. Dks.	Deals (Fir).	Battens (Fir).	Pine.	Spruce.	Pitch-pine Deals.	Deals and Battens in Aggregate.	Rough Boards (All Countries).	Flooring.	Floated Timber.
	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Loads.
Public dock stock - - -	1,585,211	3,204,541	1,223,046	1,219,249	55,627	7,287,674	4,200,037	8,178,917	29,000
Monthly public dock consumption - - - - -	226,653	450,044	80,486	98,116	12,496	867,795	520,627	1,005,798	3,208
Overside stock - - - - -	509,969	1,012,599	181,093	220,761	—	1,924,422	1,171,411	704,059	—
Overside consumption (estimated of dock):—									
77 per cent. Sawn } 50 ,, Planed }	174,523	346,534	61,974	75,549	—	658,580	400,883	502,899	—
Duration of supply at same rate of consumption - - -	5·22 months.	5·29 months.	9·86 months.	8·29 months.	4·45 months.	6·04 months.	5·83 months.	5·89 months.	9·04 months.

VENTILATION.—II.

The Advantages and Limits of "Natural" and "Mechanical" Systems Compared.

By J. D. SUTCLIFFE.

(Concluded from p. 78, No. 522.)

In many buildings it is necessary to have different rooms at different temperatures. A room where heavy manual work is being done requires a much lower temperature than, say, a drawing office. Fig. 9 shows a method by which this can be easily accomplished. Each main air-supply duct is made double, the passage for warm air being placed over that for cold air, and the branch ducts for each room are so arranged that they can draw their supply of air from either or both ducts at pleasure. The fresh air is brought into the building from the outside. It passes through the filter screen to the fan, which forces it forward through the air-warmer and warm-air duct, or through the cold-air duct, according to the valves that are open. If the room is required very warm the regulating valve is dropped and all the air-supply comes from the warm-air duct. If it is required to be cold, the valve is raised and the air enters the room at the normal temperature, or even lower in summer time. It will also be readily seen that the valve can be fixed in any intermediate position and the air can be drawn equally from both ducts or mixed until the desired temperature is obtained. This system would be very useful in many factories, as the air could be conditioned to any required degree.

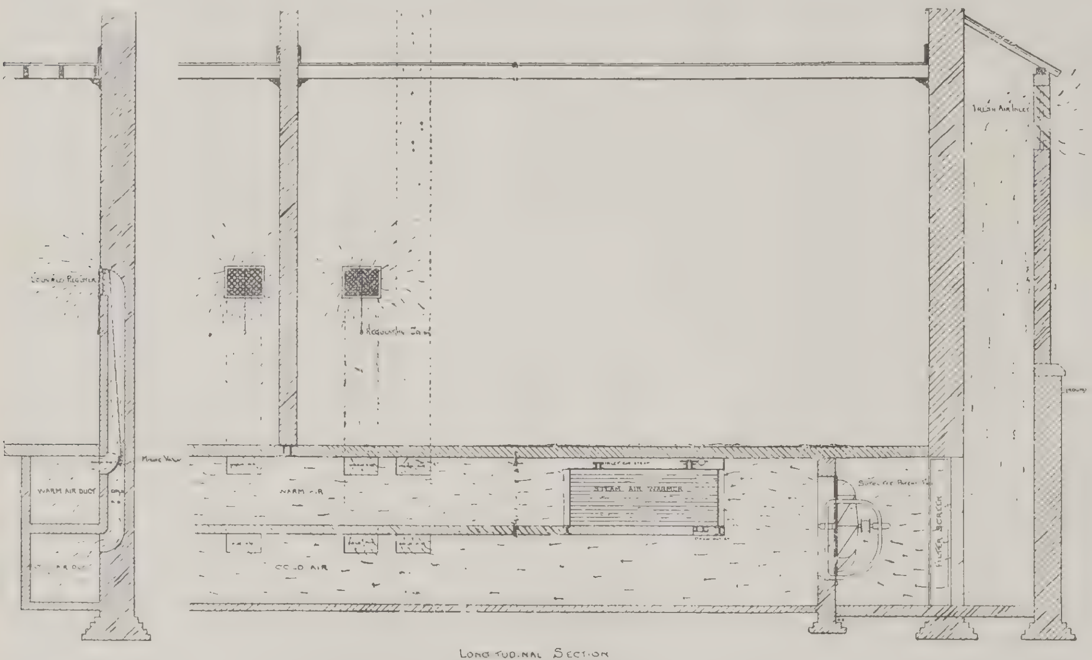


FIG. 9.—SHEWING METHOD OF CONTROLLING TEMPERATURE.

Theatres and Similar Public Buildings.

Theatres and public buildings have frequently no windows in the auditorium; they are surrounded by corridors and other rooms; they have several tiers or galleries; and no system of ventilation but the plenum is of any use. In the balconies and circles of theatres the cubic space allowed to each person is so limited that unless a large quantity of air is positively forced into them they become foul in a very short time. There are many theatres where the height between the floor and ceiling of the circles is less than 7ft., whilst the space from back to back of the seats is barely 2ft. 6ins. and each seat only occupies 1ft. 6ins. in width. This practically means that each person is in a cubicle containing only 27 cub. ft., and it requires no stretch of the imagination to see how rapidly the air in such a small space becomes impure. Another difficulty is that the "pittites" are fully dressed and often wearing their overcoats, whilst the occupants of the stalls on the same level are very scantily clothed. It therefore follows that what is a comfortable temperature for one is a disagreeable one for the other, and the stalls may always with advantage be 5 or 6 degs. higher in temperature than the pit proper.

My own idea of ventilating a theatre is to have an underground main air-duct, say, 6ft. high and 3ft. 6ins. wide, all round the auditorium wall. Into this duct fresh air should be forced by means of a fan or fans, and then five or six vertical air-ducts led from it to each of the various tiers. In this way the air will be distributed to all parts of the auditorium. The arrangement is shown fairly well in Fig. 10. The plan indicates the positions of fans, fresh-air supplies, screens, &c. The pit and stalls are best ventilated by small platforms or risers running under several rows of seats right across the theatre. Under the small platforms should be pipes for heating, so that the incoming air may be warmed to a suitable temperature. The main air-duct and the small platforms under seats are shown to a larger section in Fig. 11. This section shows how the temperature and air-supply are controlled by an attendant in the main air-duct. If he wishes to partially or wholly shut off the air-supply he adjusts the horizontal sliding door. If warmer air is wanted he pulls forward the door above the heating battery and all the air passes through the battery; if cooler air, he pushes back the door as far as necessary. A very simple form of indicating thermometer fixed in the main air-duct shows the attendant what is the temperature in every part of the theatre.

For the extraction of the vitiated air there is nothing better than a large sunburner, but these are being gradually superseded by electroliers. Now an electrolier is practically useless as an extractor and it is necessary to supplement it with an exhaust fan of sufficient power.

The entrances and stage need only be warmed by radiators. They do not require any special ventilating arrangements. Low-pressure steam is the only satisfactory heating medium, as hot water does not answer readily enough in either heating or cooling to the demands that have to be met.

Technical Schools, Free Libraries, &c.

In schools of more than one storey, and especially where there is a central hall surrounded by classrooms, no other system than the plenum is likely to give satisfactory results. The details of the system must be worked out to suit the building, and it may be either on the lines indicated for theatres, &c., or, if there are many different rooms that require to be kept at varying temperatures, the double duct system, as illustrated in Fig. 9, may be used.

Factory Ventilation.

In the time at my disposal I cannot do more than barely

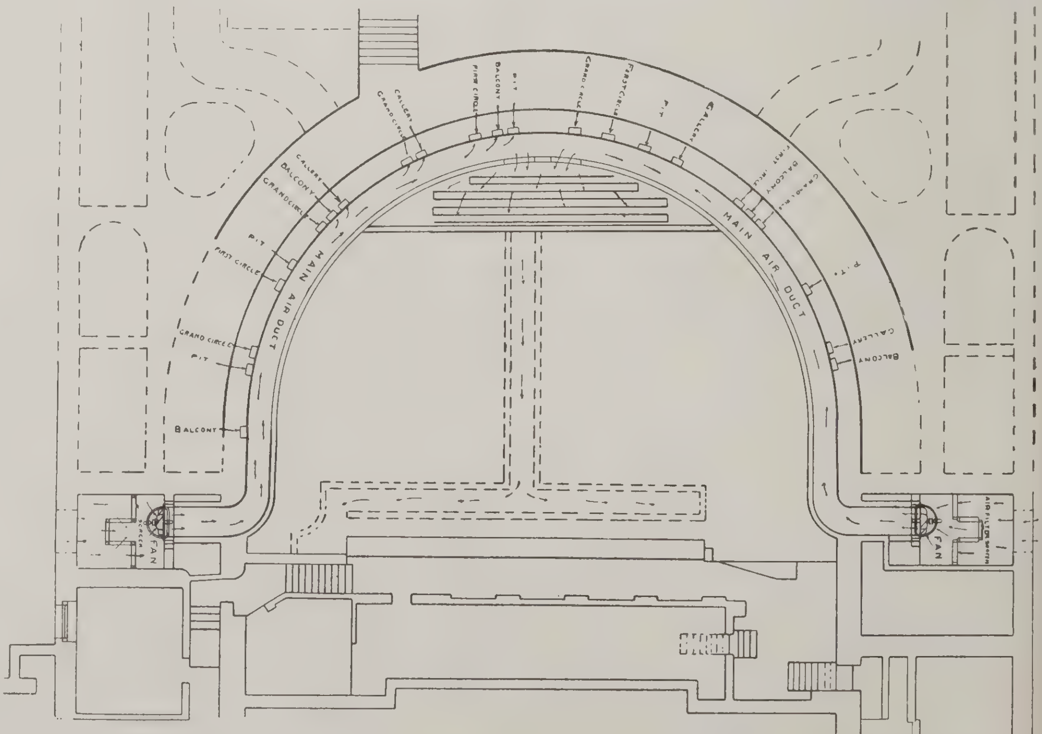


FIG. 10.—PLAN OF THEATRE, SHOWING FANS AND AIR DUCTS.

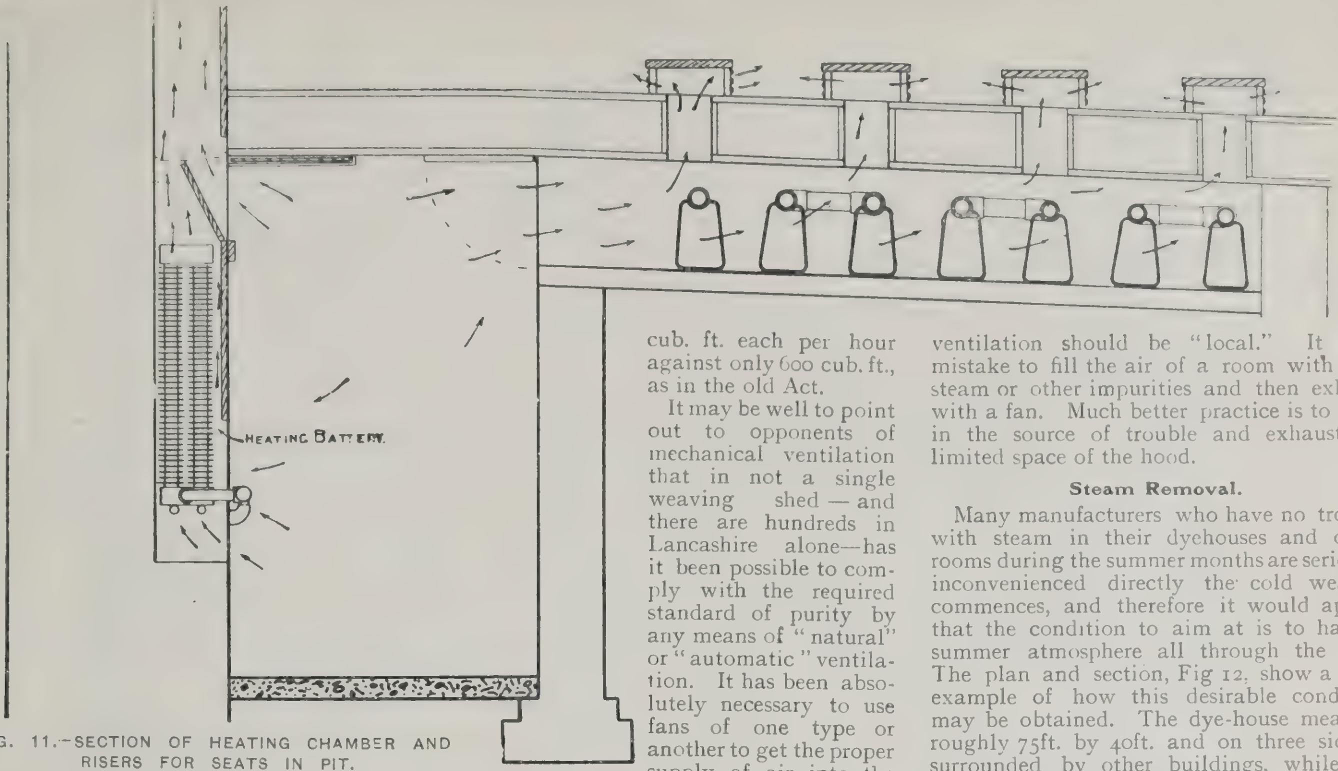


FIG. 11.—SECTION OF HEATING CHAMBER AND RISERS FOR SEATS IN PIT.

suggest a way of dealing with the various rooms or processes in a factory.

Weaving Sheds.

In the first Cotton Cloth Factories Act, controlling steaming in weaving sheds, no test of the purity of the air was imposed, but each worker was to be provided with "not less than 600 cub. ft. of fresh air per hour." This brought fans into general use in all sheds where artificial humidity was introduced, and the improvement in the health of the workpeople was most marked. The usual method was to fix 14in. or 18in. fans exhausting from the shed and to provide fresh-air inlets round the walls where possible.

In the most recent Cotton Cloth Factories Act the standard of purity of the air is fixed, and as stated previously if this standard is to be maintained at least 2,000 cub. ft. of air per hour must be supplied for each worker. By experience it has been found that to fix fans for exhausting only is not sufficient. If success is to be assured it is necessary in addition to arrange fans "blowing in." Of course, it is very different supplying 2,000 cub. ft. each per hour against only 600 cub. ft., as in the old Act.

It may be well to point out to opponents of mechanical ventilation that in not a single weaving shed — and there are hundreds in Lancashire alone—has it been possible to comply with the required standard of purity by any means of "natural" or "automatic" ventilation. It has been absolutely necessary to use fans of one type or another to get the proper supply of air into the sheds, and the tests which I referred to earlier prove that there is no difficulty in keeping within the law with mechanical ventilation.

Ventilation of Factory W.C.'s.

It is always a serious matter to fix a fan exhausting from any room to which closets are directly connected, as the foul air from the closets is certain to be drawn into the room, and this is more noticeable when the wind is blowing in at the closets. If there is a series, one above the other, it is a good plan to fix an exhaust fan on the ceiling at the top and connect all of them by means of a wooden tube. The foul air should be extracted at the level of the closet seat and the fresh air admitted by cutting 3ins. from the bottom of each door. By adopting this plan you ventilate each room into the closet, which is much better than ventilating the closets into the rooms.

Dust-removal.

"General" ventilation in factories is certainly a benefit, but where dust, fumes or especially foul air are to be removed the ventilation should be "local." It is a mistake to fill the air of a room with dust, steam or other impurities and then exhaust with a fan. Much better practice is to hood in the source of trouble and exhaust the limited space of the hood.

Steam Removal.

Many manufacturers who have no trouble with steam in their dyehouses and other rooms during the summer months are seriously inconvenienced directly the cold weather commences, and therefore it would appear that the condition to aim at is to have a summer atmosphere all through the year. The plan and section, Fig 12, show a good example of how this desirable condition may be obtained. The dye-house measures roughly 75ft. by 40ft. and on three sides is surrounded by other buildings, while the roof has a louvred outlet running almost the whole length. The steam was so dense during the winter months that it was impossible to see "your hand before you." To close up the louvres and fix a large fan exhausting the steam would only have intensified the trouble, as cold would have been pulled into the warmer air of the dye-house and would have increased the condensation without removing the steam. Instead of following such a plan, three 24in. fans were fixed in the positions shown, and as they all obtained warm air the results were extremely satisfactory. The warmth absorbed the steam, and now the place is clear in winter as in summer, and instead of a wet and dripping dye-house dust may be seen on the roof beams.

In some dye, bleach works and washhouses it is not easy or possible to get suitable warm air from any adjoining room, and recourse should then be had to a steam-heating battery for warming the air.

Basements and Cafes

are another class of room that can frequently be better dealt with by using fans than by any automatic or natural means. I wish to call your attention to the plan of a basement café shown in Fig. 13 (next page). It will be noticed that this basement has only one outside wall, and fresh air cannot be obtained at any other point. How could one hope to ventilate such a room by natural means?—as not only is it impossible to get fresh air in around the sides, but it is impossible to go through the ceiling for outlet ventilation. The actual café is 70ft. by 30ft. wide by 11ft. 3ins. high, and a 24in. fan is

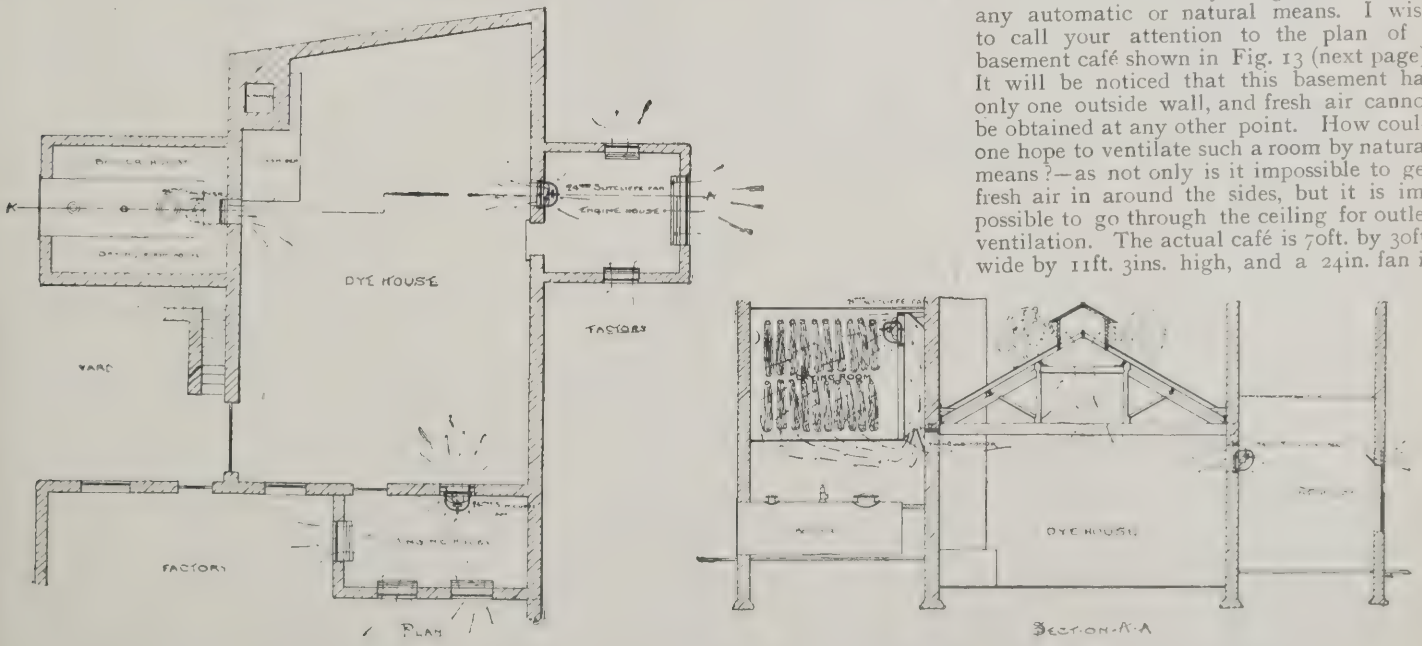


FIG. 12.—PLAN AND SECTION OF DYE-HOUSE &C. SHOWING FANS FOR INTRODUCING WARM AIR TO ABSORB STEAM.

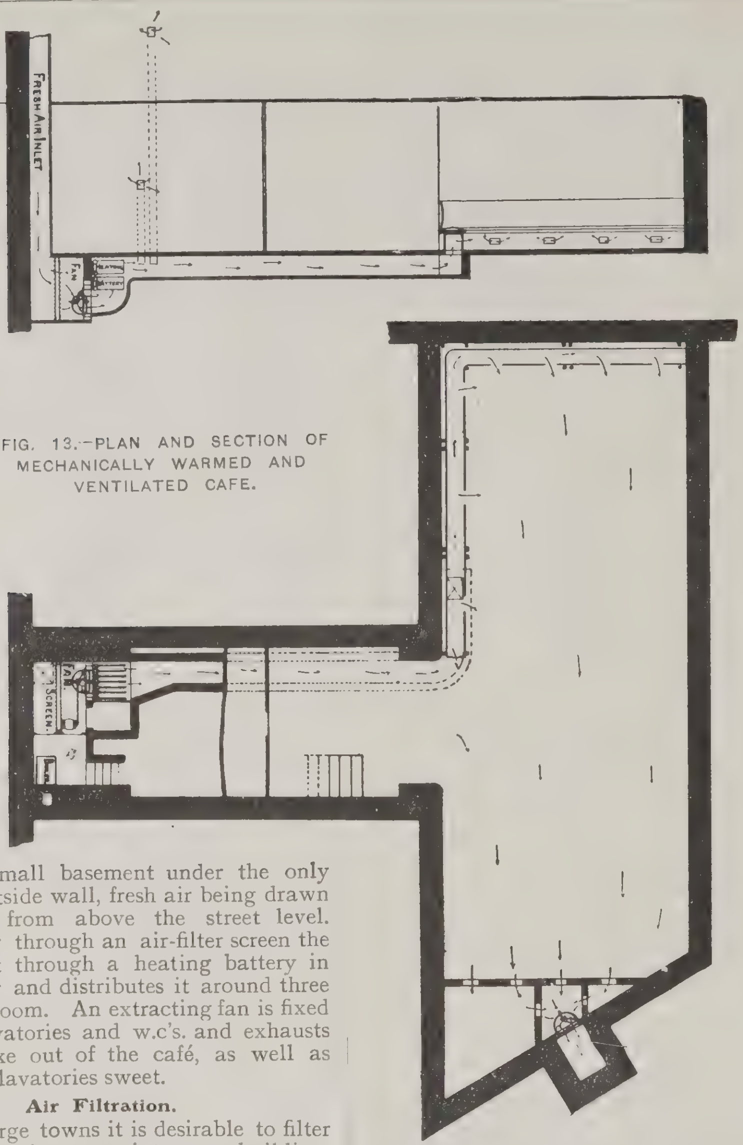


FIG. 13.—PLAN AND SECTION OF MECHANICALLY WARMED AND VENTILATED CAFE.

fixed in a small basement under the only length of outside wall, fresh air being drawn downwards from above the street level. After passing through an air-filter screen the fan forces it through a heating battery in cold weather and distributes it around three sides of the room. An extracting fan is fixed over the lavatories and w.c's. and exhausts all the smoke out of the café, as well as keeping the lavatories sweet.

Air Filtration.

In most large towns it is desirable to filter the air before it passes into any building, but this is not easy to do unless fans are used to compel the air to pass through the filter. Thin layers of cotton wool have been tried in Tobin tubes, but even a thickness of ½in. across the tube will reduce the air supply by 90 per cent., and frequently stop it altogether. Fine wire or perforated zinc over an inlet will lessen the velocity by 50 per cent. or more, and, in fact, any kind of screen or filter will stop the supply of air to a greater or less extent unless mechanical means are adopted. Many experiments have been made with cotton and jute cloths, matting, &c., but none of these seem to approach in efficiency the coke screen seen in the illustration, Fig. 14. Two frames of strong wire netting are securely attached to a wooden support about 5ins. thick. The netting should be of about ¾in. mesh and made from wire of 16's to 18's gauge. On the side furthest away from the fan a door is constructed at the top for filling with coke and a door at the bottom for emptying. The screen should have a superficial area at least equal to six times the area of the fan used. The coke, before it is placed in the screen, should be carefully washed and passed through a 1½in. mesh, as the best size for the coke is about 2ins. diameter.

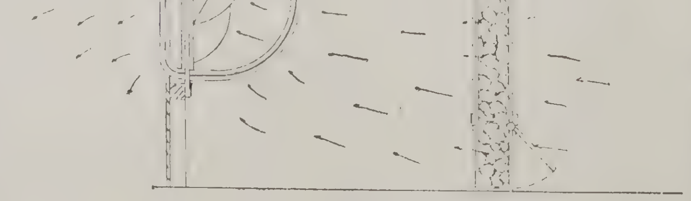


FIG. 14.—FAN AND COKE AIR FILTER.

For cooling in summer water can be sprayed against the screen and it can be washed down at any time with a hose pipe without disturbing the coke. All smuts and dust will be filtered out of the air, and even fog is very sensibly reduced by passing through the screen.

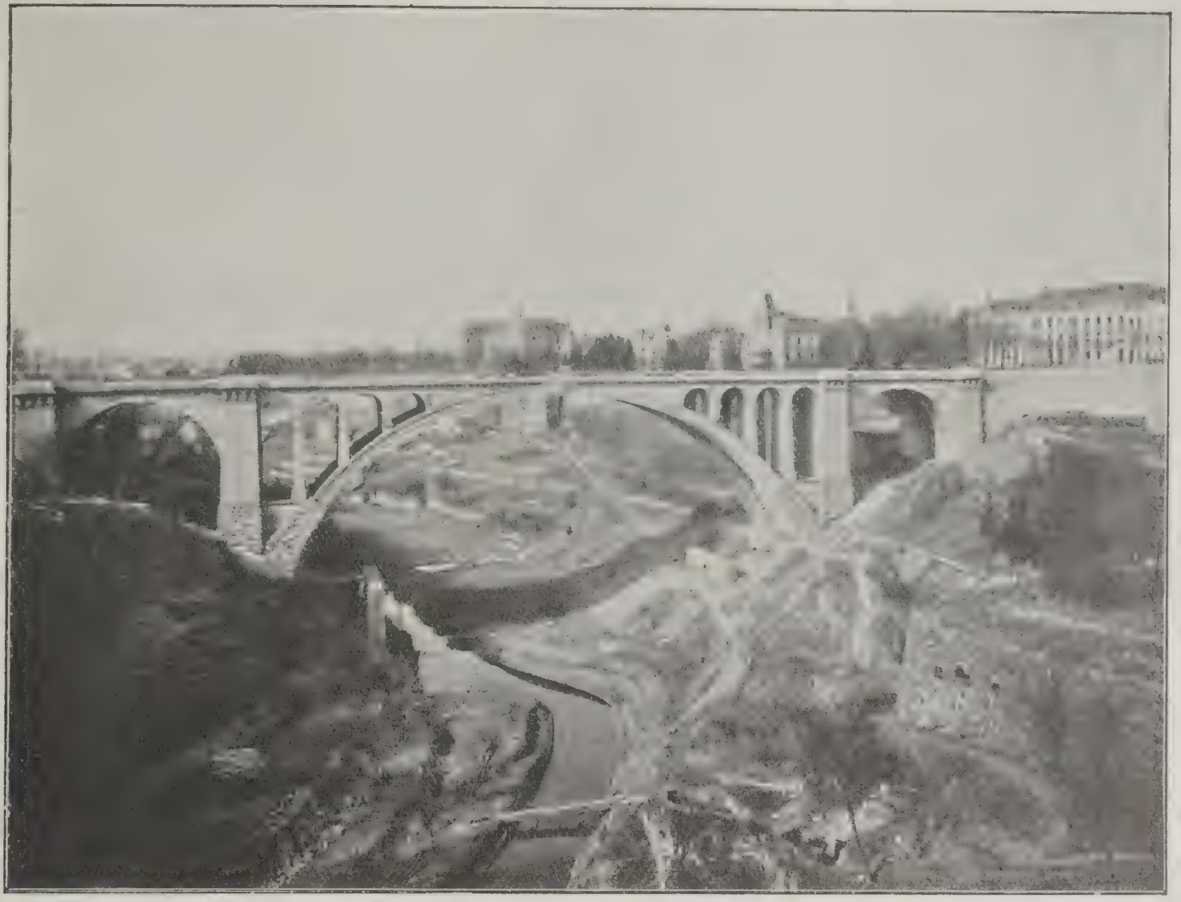
Law Cases.

Tenancy of a House and Dry-rot.—At the Liverpool County Court recently a stationer named Jones sued his tenant, a banker, living at 10, Cheltenham Avenue, Liverpool, for £77 17s. 6d. for breach of an agreement as to the tenancy of the house, and alternatively for the cost of repairs to the house he was called upon to do, which he alleged should have been done by the defendant under the agreement. The plaintiff's case was that the defendant in 1902 took a three years' lease of the house, under which he agreed to keep it in repair. The rental was £48 a year, which was a reduced amount, having regard to the nature of the agreement to repair. At the end of the second year the local health authorities required repairs to be done, and as the defendant disputed that they were such as came under his agreement he (plaintiff) had been obliged to carry them out, at a cost altogether of £77 17s. 6d. The plaintiff alleged that these were mainly occasioned by dry-rot, caused by the defendant allowing ivy and other creepers to grow over and close the ventilation holes over the foundation walls and by his having used brown paper under the carpets in some of the rooms, which had retarded the circulation of air. The defence was that the dry-rot was due to inherent defects in the building, for which defendant in law was not responsible. The jury took that view and found for the defendant with costs.

[Our expert "F. S. I." observes in regard to this case that he recently gave advice in our columns exactly opposite to this decision, which he considers contrary to "law," though it may be good "justice."—Ed. B.J.]

Lift Wells.—The case of *Cowtan & Sons* (*Ltd.*) v. *Waygood & Co.* (*Ltd.*) came before the King's Bench Division of the High Court of Justice last week. The plaintiffs, a firm of London builders and contractors, claimed against the defendants—lift makers—an indemnity against liability in respect of compensation paid by them to a painter named Jobelmann under the Workmen's Compensation Act, 1897, by virtue of an award by the judge of the Westminster Court, together with costs. It appeared that in October, 1903, the plaintiffs were doing constructional work and repairs at No. 12, Grosvenor Square, where also the defendants were constructing a lift, the structural work for which had been done by a third firm of contractors. The plaintiffs' case was that the defendants had control of the well in which the lift was to run, and that as a consequence of their neglecting to sufficiently guard the entrances to it Jobelmann fell down the well and sustained serious injuries. The jury found that, though the defendants had possession and control of the well, they had not been guilty of negligence. Mr. Justice Ridley therefore gave judgment in their favour.

Buildings Wrongly Licensed by Borough Council.—After several lengthy hearings, Mr. Lane, K.C., the magistrate sitting at the West London Police Court, recently gave judgment in regard to a summons taken by the London County Council against the Fulham Football and Athletic Club, Ltd., for retaining a temporary building on their ground without obtaining the approval and licence of the Council, as required under sections 82 and 83 of the London Building Act. The building (erected in August, 1903) afforded seating accommodation for 1,000 people in tiers varying from 3ft. to 30ft. above ground, and comprised also in the lower portion dressing-rooms, bathrooms and lavatories for the players, also refreshment-rooms, store-rooms, &c. The various rooms were lighted and warmed by gas, and a proper system of drainage, &c., was provided. Except as to the materials and method of construction, the building had more the character of a permanent structure than a temporary one. It was constructed with wood framing braced in places with iron rods and straps, covered and enclosed externally below the tiers of seating with corrugated iron, and was also roofed with corrugated iron. The contractors, Messrs. Robert Iles, Ltd., of Fulham, erected the building under a licence granted by the Fulham Borough



BRIDGE AT LUXEMBURG.

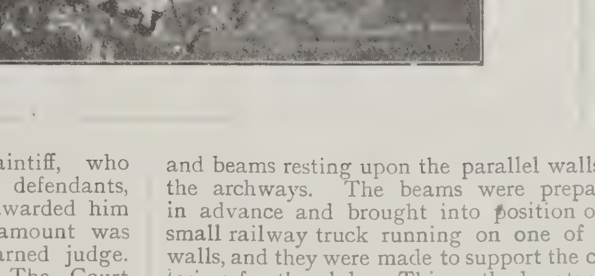
Council for a temporary wooden structure or one year on the condition that the strucure was to be erected to the satisfaction of he borough engineer and surveyor, which icence was renewed in September, 1904, for one year. After hearing the evidence and he arguments of counsel, the magistrate decided that the building was a composite tructure made of wood and iron, and thereore was within the jurisdiction of the London County Council, requiring their approval nder section 82 of the London Building Act, 1894. The magistrate further made a demolition order that the building should be completely removed within five months *i.e.*, the end of the present season), and imposed a nominal fine of 10s., each side to pay its own costs.

Interesting to Trade Unions.—In the Court f Appeal on Friday judgment was given in he case of *Airey* v. *Weighill and Others.* This was brought by Weighill and two other rustees of the Operative Stonemasons' Society and another defendant named Elliott, who was he local secretary of the Sunderland branch f the Union, against a verdict and judgment hat had been entered against them and ertain other defendants, who did not appeal, at the trial which took place before Mr. ustice Grantham and a special jury at Newastle-upon-Tyne. The facts were, shortly, hat the plaintiff, a stonemason, had for ome years been a member of the Union, but on becoming a foreman he resigned his membership and joined the Foremen's Society. Trade became bad and he went back to work as a mason, obtaining employment with a master named Shafto, who carried on business at Sunderland. The men declined o work with him unless he again joined heir Union, and as he refused to do so they ent in notice to Mr. Shafto that they would not continue working for him. The master thereupon dismissed the plaintiff, who brought this action against the defendants, with the result that the jury awarded him £8, and judgment for that amount was entered, with costs, by the learned judge. Hence the present appeal. — The Court allowed the appeal and gave judgment for the defendants, with costs.

A REINFORCED CONCRETE BRIDGE.

A MOST interesting application of reinforced concrete is afforded by the platform of the new bridge at Luxemburg (between Rhenish Prussia and France), which has one of the largest stone arches in the world, the span being about 250ft. The construction was conducted by M. Séjourné, Director-in-Chief of the Bridges and Roads Department. The platform of the bridge is supported by two twin arches about 16ft. thick, leaving an open space of about 18ft. between them. These arches were erected one after the other, the scaffolding and centering being simply shifted when the first arch was completed in order to support the second one. This method proved very economical in saving a considerable amount of scaffolding. The stonework was erected by Messrs. Fougerolle Brothers, contractors, of Paris.

Various kinds of reinforced concrete platforms were put before M. Séjourné by all the best-known specialists in France and Germany. In the end M. Edmond Coignet, a well-known Paris contractor, was chosen for the work, his system offering considerable advantages over all others. The platform supporting the roadway was made of slabs and beams resting upon the parallel walls of the archways. The beams were prepared in advance and brought into position on a small railway truck running on one of the walls, and they were made to support the centering for the slabs. This method, patented many years ago, has been frequently employed by M. Coignet and has always given very satisfactory results, both in economy and rapidity. The section below shows the method by which the centering is supported in the Coignet system. There are 72 beams, spaced every 6ft., the ends resting on the walls. The beams are 20ft. long, 16ins. wide and 19ins. high. The reinforcement consists of four bars of 1¾ins. diameter in the lower part of the beam, working to extension, and four bars of about 1in. diameter in the upper part, working to compression, both sets of bars being linked together by ties of ¼in. diameter. The slabs resting on the beams are 7ins. thick and reinforced with ¾in. extension bars and ½in. compression bars. The supporting load was that of a 20-ton roller. It may be interesting to mention that owing to the development of reinforced concrete in this country M. Coignet has thought it advisable to open a branch in London, and Mr. G. C. Workman, C.E., of 43, Chancery Lane, has been appointed agent.



SECTION OF COIGNET BEAM

SUPPORTING CENTERING FOR SLABS.

THE ARCHITECTURAL ASSOCIATION.

Mr. Spooner on Church Fittings.

A MEETING of the Architectural Association was held on Friday at 18, Tufton Street, Westminster, the chair being occupied by the president, Mr. Guy Dawber, F.R.I.B.A. Messrs. J. M. H. Watson, C. E. Lovell, R. C. Coulson, N. Jewson, T. D. Dixon, J. Filtness and A. A. Fillary were elected members of the Association. It was announced that Mr. James Lemon and Mr. A. S. Millar had rejoined.

A vote of condolence with the widow and relatives of the late Mr. John Leaning was passed.

The president stated that, for various reasons, the smoking concert arranged for March 6th would not be held.

A vote of thanks was passed to Mr. W. G. B. Lewis for the trouble he had taken—almost a year's work—in arranging and supervizing the hanging of the collection of casts in the museum.

Mr. Charles Spooner then read a paper on "Church Fittings"—under which title he included the furniture and ornaments of a church and such decoration as was connected therewith. After referring to the "high" and "low" phases of religious worship, Mr. Spooner went on to enumerate the "ornaments rubrick" of the Church of England, observing that some — such as crescents for lights and the chafing ball—had become useless, while others seemed to be outside their subject: in this connection he cited Mr. Micklethwaite's authoritative tract issued by the Alcuin Club.

The Altar.

The most important thing in the church was the altar, the best ways of treating which were the two that had centuries of precedence, namely, to place it on a raised platform reached by a flight of steps, and then, if possible, to put a canopy over it or, at any rate, to provide some rich background. Altars in England had been mostly of stone or marble, but latterly some chancellors of dioceses had objected to them being such, which Mr. Spooner thought was regrettable and curious considering the words of the rubrick. It was important that the altar should be of sufficient size. No considerations of utility need limit the length, but anything shorter than 5ft. was likely to prove inconvenient. Utility would regulate both the height and the width. During the whole of the celebration the priest *stood* at the altar, which, therefore, should be high enough to avoid the priest stooping unduly. Although men varied considerably in height, it had been found by experience that 3ins. was the limit of variety in the height of an altar. Anything lower than 3ft. 3ins. was most inconvenient for a tall man, and 3ft. 6ins. was as high as a short man could possibly use. Mr. Spooner said he had made some altars 3ft. 6ins. high, and the clergy who used them said that height was convenient; but this was the extreme limit; perhaps 3ft. 5ins. was the most convenient height for an altar. It was important not to make it too wide. The corporal (*i.e.*, the altar cloth) was usually about 20ins. square, and a little more width than that was needed; 2ft. was as narrow as an altar should be; 2ft. 3ins. was better. Unless the altar shelf (when it was intended to have one) stood on the altar, 2ft. 6ins. would be found to be wide enough for any altar. Altars should be quite simple in design, with no elaborate mouldings or carvings in high relief. It was essential for the edge of the top to be almost square; the angles should be just softened; and, if it was desired to enrich it with mouldings, they should be sunk into the flat edge; on no account should they turn over on to the top of the slab. Unless the top of the altar was perfectly flat and smooth right out to the extreme edge, there was a risk of the sacramental vessels being upset and there was also a danger of irregular projections or points catching in the vestments of the celebrant. The top or slab should be thick and heavy. A slab of stone (or, better still, marble) carried on five pillars was perhaps the best general form; or if wood were used, then it should be framed together with five or more legs braced at the bottom, and have a thick top framed with flush panels so that it might not split or warp. He had made wooden altars with framed fronts, ends and backs; but he did not think that was the best way, and consequently recommended the form of a heavy table as being altogether better.

What he had said about altars applied to all, whether a high altar or side altars, with one exception, namely, the minimum length of 5ft. was not enough for a high altar—*i.e.*, an altar which might be used for a high celebration: the minimum length in this case should be 8ft., as the celebrant, the deacon and the sub-deacon stood side by side in certain parts of the service, and anything shorter than 8ft. looked undignified. In churches where there was only one altar it was better to make it the high altar, and a length of 8ft. would not be found excessive even in the smallest churches.

Altar Steps.

A high altar should always stand raised upon a platform, three steps above the level of the sanctuary floor, and not more than three. (These three steps were required for the celebrant, the deacon and the sub-deacon, or, as they were sometimes called nowadays, the gospeller and epistler.) The top step should be deeper from front to back than the others—a clear space 3ft. at the least was necessary in front of the altar, and rather more was better. The other two steps should be at least 18ins. deep (front to back). The height, or rise, was a matter of taste and would be different under different conditions, but it would be found inconvenient if the rise of each step was greater than 7ins. The rise of all three should be the same. The sanctuary itself might be at any level above the chancel that was not inconvenient.

The altar shelf had become very usual nowadays. It was better for it to be behind the altar rather than upon it, unless the altar were very broad, in which case it should be loose. In the former case it became the base of the reredos. The shelf should be from 9ins. to 12ins. wide, to give room for the cross and candlesticks to stand upon it, and it should not be too high.

Reredos.

The object of the reredos was to give dignity and importance to the altar, and this should be the first consideration in designing a reredos. It should be spaced in such a way as not to detract from the altar nor to overpower it, but rather to add to its prominence and make it unmistakably the principal object at the east end of the church. He did not consider mosaic to be suitable for a reredos unless the latter formed part of a complete scheme of mosaic decoration, and he thought it was a safe rule never to use mosaic unless it could be at least 15ft. from the eye. Generally speaking, he thought the reredos was better as a separate thing, not forming part of a scheme of wall decoration, but a definite background to the altar, a sort of solid screen at the back of it, with perhaps the altar shelf or shelves forming part of it.

As to painted reredoses, everyone would find his own method of using colour, but one very good way was to lay on the colour very bright—almost, if not quite, pure—and then to glaze it down with thin coats of colour superimposed till the brightness or crudeness had been brought down to harmonious tone. Personally he much preferred tempera to oil paint. It had a pleasanter quality and darkened less with time.

The Upper Frontal, or Dorsal,

might be of any material (even cotton) and hung in any way that would give a good effect. It could be brought right forward over the altar as a canopy, but it looked much better if the material was in one piece suspended over rods rather than strained over a board. A canopy, however, was apt to get very dirty from the smoke of the candles and therefore it should always be considerably above the altar; and for the same reason it was well to arrange for the candles to stand well away from the dorsal, or from the reredos either.

At either end of the altar should hang

The Curtains or Riddles.

They should be about as wide as the altar, and might be of any height so long as they were well above the candles to protect them from being blown by currents of air.

The dorsal and riddles might be of any colour harmonizing with their surroundings. They were not changed with the frontal to the colour of the day. In choosing the material for them it was absolutely necessary to see a large piece in the church in the position where it was to hang.

Frontals and Frontlets.

The frontal need not be mounted on a wooden frame. If well made with a proper backing it could be hung with rings and hooks under the slab of the altar. The five liturgical colours in the Church of England were white, red, green, purple and black, so that five frontals were required.

The frontlet need not be changed with the frontal, and might be of any colour that would harmonize with the five.

Frontals and frontlets were usually ornamented with embroidery, and, when this was well done nothing could be more beautiful or suitable. But it needed an artist to do it. The firms and the church shops had failed in this respect just as dismally as they had in pictures and windows.

A carpet for the floor and the steps in front of the altar was a great addition—almost a necessity—and Mr. Spooner said he liked to see it brought right down the chancel—giving a fine bit of colour and a strong leading line up to the altar. Tapestries might be used with good effect in many places, particularly on the east wall and around the sanctuary.

Altar Cross and Candlesticks.

The altar cross should not be very large, for it was the standard in front of the priest rather than in front of the people. The great rood answered the latter purpose.

Candlesticks should be of the same material as the altar cross—not necessarily of brass, which was doubtless a good material, though generally spoilt by being lacquered; sometimes a material of another colour would look better.

Font.

After the altar the font was the most important thing in the church. The best place for it was at the west end, in the middle. A cover was essential, but now that the water was blessed at every baptism and discharged into the earth when the service was over, it seemed unnecessary to line the font with lead, unless a porous stone was used. A waste pipe was necessary (with a plug) discharging into a dry well in the ground. A desk to hold the priest's book was a great convenience, though seldom provided. It might be made removable, fitting into sockets in the font.

Piscina and Sedilia.

One did not always find a piscina in modern churches. It was supposed not to be required, but that was a mistake. It was required as much to-day as it was in the Middle Ages, and for similar purposes. It might be made as a beautiful little niche in the south wall of the sanctuary, combined with the credence, although a projecting shelf or table was more convenient than the small shelf found in many old churches. The drain from it should always run into the ground.

The sedilia—the last remnant of the bench which in primitive times ran all round the apse and was assigned to the priests—was a triple seat for the celebrant, deacon and sub-deacon. It should always be on the south side of the sanctuary. In old days it was generally formed in a triple niche, or arcade, recessed in the wall, but of late years it had become more usual to make the sedilia a separate and movable piece of furniture, generally of oak, sometimes with a back and canopy, and, on the whole, it suited us better than stone seats, which were apt to be rather cold. In building a new church it would be well to form a recess in the south wall large enough for three seats side by side, and to fix a wooden seat and back divided into three, allowing a width of at least 2ft. for each seat. There was no longer any need for a canopy now that the windows were filled with glass and the church was comfortably warmed.

Rood Loft.

The next items in the list were screens, the rood loft and the rood. In former days the rood loft was used as a minstrels' gallery, as strolling minstrels were hired for great festivals, but nowadays it was questionable whether a rood loft should be provided unless required for practical use, which would only be the case in some churches. We no longer engaged strolling minstrels who had to be put where they could not get at valuables in case they should be tempted to steal!

Chancel Screen.

There were a few conditions that should regulate the design of a chancel screen. The clergy stalls ought to return against the chancel side of the screen; therefore the lower part needed to be panelled with solid panelling to a sufficient height to form the back of the stalls, from 3ft. to 4ft. from the chancel floor. It was undesirable to block the view of the altar from the congregation, and, unless the altar was raised on steps, a high solid base to the screen would do so. If the chancel were long enough, the floor should be raised only one step above the nave, and the sanctuary three more steps beyond the choir seats, leaving enough space at the east side of the choir seats for easy access to them on their own level—say, 2ft. 6ins. or 3ft. wide. It was awkward for the members of the choir to have to step down to reach their places. Thus, two steps, with a tread of 12ins. each, would ascend from the level of the chancel to a space at least 4ft. wide for the communicants; then one step more to the level of the sanctuary floor. A space of at least 5ft. 6ins. must be allowed before the rise of the next step. (The altar rail, if there were one, should be set 18ins. back from the front edge of the communicants' step, leaving a width of 4ft. within.) Then two more steps, each 18ins. wide, and a foot space in front of the altar 3ft. wide, making a total length eastwards beyond the choir seats of 18ft. 6ins., or 19ft. to the front of the altar. The altar itself would be raised seven steps above the nave—say, 3ft. 6ins. or 3ft. 9ins.: in the former case all steps having a rise of 6ins., in the latter the first four having a rise of ins. and the last three 7ins. The screen would be fixed on the first step, and the panelled base might be 3ft. 6ins. high without hiding the altar. The central opening should be nearly as wide as the altar—7ft. or 8ft. in a narrow church and more in a wide one. It was well to have as few mullions as might be and for them to run up a considerable height before the more intricate and ornamental part of the screen began. Where a loft was not required a strong horizontal line looked well at the top, with or without cresting. In churches where there was no chancel arch Mr. Spooner said he saw no reason why the screen should not run up and be framed into the timbers of the roof, with the rood and any other figures worked into the design of the screen itself. In some churches a high screen might not look well. In such cases a low screen of stone or wood was wanted to stop the return stalls. The rood might then stand upon a beam or, what was better, be suspended in the chancel arch. Most, if not all, mediæval screens were painted, and there was every reason why modern screens should also be decorated with colour.

Gates might be added, either of wood or metal, and in churches where valuable or holy things were kept in the chancel they were most desirable.

Choir Stalls, Seats and Desks.

The growth of the choir in most modern churches necessitated a considerable amount of accommodation, though many churches had too large a choir. The old arrangement could hardly be improved upon, unless it was considered better to turn the choir out of the chancel into a gallery at the west end. One row of seats for men and one for boys on each side of the chancel should be enough for any parish church. It was better not to divide the seats with arms or elbows, as that arrangement would make the whole very long and would fill up the chancel too much. The great thing was to arrange the seats not only to leave plenty of room in the chancel but also to give the appearance of space. Mr. Spooner said he thought it was a mistake to raise the choir seats above the level of the chancel, because then too much prominence was given to the choir. No better arrangement had yet been devised than that of returning the back row of seats against the screen for the clergy. These seats might very properly be divided by elbows when that luxury could be paid for. The advantages of this arrangement were that the clergy were brought well out into the church in the most convenient position for them to take the service.

The desks should not be too near the seats, nor too high; plenty of room should be left for kneeling, and the height made convenient for that attitude; there should also be an extra shelf or shelves for books below the desks. The boys only would want a desk, which should be as small as convenience would allow.

Lectern.

As to the lectern, the eagle form, if artistically treated and made very much unlike a real bird, might be rather nice. But personally he thought the form of a double or single desk was much the best. It might be treated in a great many different ways, with or without candle-holders, and made of either wood or metal. The lectern should stand on a step or platform raised above the level of the nave, more or less according to the size of the church. The top of the desk should not be too high, because the reader's voice would be checked. This was one of the few cases in which utility clashed with appearance.

The Organ.

When planning a church it was important to provide a place for the organ. Much had been said about the best position for it, and he understood musicians agreed that a gallery at the west end, or the rood loft, was the best place for it. But there were objections to both of these places if the church was not very lofty. Unless there was a clearstory a large west window was necessary to light the church, and an organ at the west end would block up that window. Again, it was difficult to make a clearstory look well from the outside unless a good deal of money could be spent on the building. He had not seen a modern inexpensive church with a clearstory that seemed to him to be successful externally. He particularly disliked a lean-to roof over the aisles. Lofty aisles with a flat roof and a parapet got over the difficulty, but this was of course rather expensive and might not suit the position of the church. A minimum height of 17ft. was wanted for an organ, and that would only do for a small one: 33ft. was required for a fair-sized organ. A clear space of even 17ft. above the rood-loft to the wall-plate meant a lofty church. In any case the organ should be divided and placed each side of the loft, as the middle was required for the rood. It was obviously objectionable to shut it up in a small chamber. Perhaps the best way was to provide two small shallow transepts on either side of the chancel for the swell-box and other parts, and to bracket out for the pipes. The drawback to this plan was that it increased the cost considerably.

Organ pipes, unless gilt, looked best their natural colour; if decorated at all, the patterns should be very quiet. It was better to arrange for the organ to be blown by a small gas or oil engine or an electric motor, as being more convenient, and in the long run cheaper, than hand labour. But if the organ was to be blown by hand, then the lever should be so arranged that the blower was not shut up in a chamber where he could not take part in the service.

Pews

should be made as inconspicuous as possible and light in appearance, with either solid ends or framed ends and with low backs to enable people to kneel comfortably and reverently. The rule of the Ecclesiastical Commissioners that seats must be 3ft. from back to back should be looked upon as the minimum—3ft. 3ins. was better. Mr. Spooner said the best modern pews he had seen were designed by Mr. Norman Shaw for the church at Bedford Park. As to material, of course any wood might be used—except varnished pitch-pine, the colour and grain of which would most certainly disfigure any building into which it was put. Cheap pews should be painted and varnished.

Pulpit.

The pulpit might stand in almost any part of the church. The height of the floor of it would, of course, vary with the size of the church, but it should never be very high. The sides should be 3ft. 3ins. above the floor and the top should be broad enough to hold books. A small removable desk was necessary for those who used manuscript or notes: it should be so contrived as to be easily raised and lowered and easily and rigidly fixed: it was best made of metal, with a leather desk tightly strained: the "horrid little cloth" called by the shops "antipendium" should be eliminated. The diameter of the pulpit should be ample, never less than 3ft. A seat was unnecessary. A lower shelf inside was useful for books, and a secure corner for a glass of water. A sounding-board over the pupil was generally advantageous and a background of wood was often helpful to a weak voice. Mr. Spooner considered that wood was very much the best material for a pulpit; it looked well painted and added colour to the church.

Litany Desk: Notice-Boards.

The Litany desk should be large enough for two, or in large churches three, to kneel side by side, and might be covered by a cloth.

Notice-boards, generally such unsightly things, could be made satisfactory with the permanent notices on one painted with good lettering and the other provided with a glazed door and the notices within written by someone who had learnt to write legibly and not disagreeably—with which remark Mr. Spooner concluded his paper.

A discussion followed in which Mr. Harry Sirr, Mr. F. C. Eden, Mr. C. J. Tait, Mr. Fellowes Prynne, Mr. Geoffry Lucas and Mr. Dawber took part. Mr. Sirr mentioned that the rood loft was used in mediæval days not only for minstrels but for little organs, and even the priest said part of the service from it. Mr. Eden thought narrow altars were undesirable, and cited several old examples to show that they used to be almost square. Mr. Prynne said that, as assessor in several church competitions, he had been amazed at the deplorable ignorance of the A.B.C. of church architecture exhibited by many of the competitors, one of whom, he mentioned, sent in a Saxon design "as he thought it had not been used lately." In dealing with the parson the architect had to deal with a faddist who considered he was an expert because he had read Bloxom and others, including Mr. Percy Dearmer (himself something of a faddist). A non-constructional altar might be correct from an ecclesiastical point of view, but the law had not been observed and in country places where there was a difficulty in having a change of frontals the altar was better with painted panels. The reredos had proved one of the most difficult problems to English architects: it would have been better in many cases to have used a dorsal than a poorly-carved reredos. Personally he did not favour tempera work because it did not last; the lime seemed to eat through; he thought oil painting was better, on very coarse canvas fixed to the wall with mastic and lined with white lead. Mr. Lucas expressed the opinion that a few low steps in the sanctuary were better than a "climb." The font should not be put in a baptistery—that was not an English treatment—but well in view west of the south door. A chancel screen was intended to keep people out and must have a gate. Mr. Dawber said it was better to light the altar from either side rather than to have a strong patch of light above. Mr. Spooner, in replying, said the "tempera" he had referred to was an egg medium on a gesso ground. This was durable and had a most beautiful quality. Oil paint got very "horny" and lost in freshness and translucency.

The president announced that the next meeting would be held on February 24th, when Mr. F. J. Osborne Smith would read a paper on "Country Houses and Accessory Buildings."

Obituary.

The Estate of the late Mr. Richard Mawson, architect, of Bradford, who died on December 9th, has been valued at £22,003 gross.

Mr. William Brunton, builder, of Jedburgh, Edinburgh, died on February 5th, aged 67. He was head of the firm of Messrs. William Brunton & Son.

Mr. George Tyrrell, a well-known Government contractor, died at Yarmouth on Friday, aged 84. He constructed the Bembridge forts, the forts between Plymouth and Plympton, and the extensive works at Hurst Castle. He also constructed the Royal Naval Hospital at Yarmouth, built Tenby and Calder lighthouses, and restored the Haisborough lighthouse.

Mr. John Leaning, F.S.I., the well-known London quantity surveyor and author of the standard book on quantity surveying, as well as of others on specifications, the conduct of building work, and the duties of a clerk of works, died recently, aged 65. He had been suffering from acute indigestion for many months and on February 3rd underwent an operation for appendicitis: heart failure followed, and he died a few days afterwards. He was buried on Thursday last. Mr. Leaning was born at Colchester, and as a young man went out to Australia, where for several years he was engaged in the office of the Surveyor to the Crown Lands at Melbourne. He returned to England in 1868 and built up a large and influential practice as a quantity surveyor.

Keystones.

For the proposed National Gallery for Scotland the Edinburgh Town Council has unanimously agreed to offer the Government a site on Calton Hill.

New branch Savings Bank Premises at Lochee, Dundee, have been erected from designs by Messrs. Johnston & Baxter, architects, of Dundee. The building has been successfully adapted to an awkward site.

Sir William Grantham is proceeding with the building of the cottages with which the Chailey Rural District Council was dissatisfied, but the Council has not yet decided what further action it will take.

Colwyn Bay Improvements.—Colwyn Bay is spending £75,000 on a new main sewer and £32,000 on extending the esplanade, the contractors for which are Messrs. Underwood & Brothers, of Dukinfield.

Pulling down York Castle Walls.—The Finance Committee of the York City Council, to whom the matter was referred, do not consider that this is an advisable scheme for providing work for the unemployed.

R.I.B.A. Prizes and Studentships.—The annual exhibition of these drawings at the Alpine Club was visited by nearly 1,100 persons. The number of competitors was 80, as against 73 last year: strainers, 302 and 321 respectively.

The Wellington Monument in St. Paul's.—Miss Florence Le Jeune, the late Mr. Alfred Stevens's god-daughter, writes protesting against the placing of his little lions around the Wellington monument in St. Paul's Cathedral.

Building Construction Examinations, South Kensington.—It should be stated that Prof. Henry Adams, M.I.C.E., has been appointed "a" chief examiner in building construction under the Board of Education, South Kensington, not "chief examiner" as given on p. 81 of our issue for last week. Mr. Slater is also a chief examiner.

A Pump Room and Baths at Matlock Bath are proposed to be erected. The scheme is under consideration by the Matlock Urban District Council, and arrangements have been made for taking the opinion of the residents on the matter. The proposed site is on the bank of the Derwent, on the ground now occupied by Briddon's Mews and the "Fish Pond."

Modern Architecture in London was the subject of a paper read before last Thursday's meeting of the Leeds and Yorkshire Architectural Society by Miss Ethel Charles, who, as Mr. G. B. Bulmer (the president) explained, is the only lady Associate of the Royal Institute of British Architects. Miss Charles said that London was said to contain more bad work than any city in the world for its size, though it also possessed some of the finest buildings in existence, most of which had been erected during the last thirty years. Salt-glazed bricks were not used nearly enough; they had the merit of keeping their colour and did not collect the dirt and grime like stone and brick. Views were shown of New Scotland Yard, the National Liberal Club, the City of London Schools, the London School Board offices, and many others, to illustrate how the general tendency of modern work was to experiment rather than to rely on tradition, how modern work was personal rather than national, and how its endless diversity was intensified by the complexity of modern life and modern requirements, and the large quantity of material within easy reach. Much of the unsatisfactory appearance of our street architecture was attributable to the use of steel, unacknowledged.

The Holborn-Strand Improvement will be completed before the end of this year. The total estimated gross cost was £5,148,920, but the value of the surplus land and capitalized receipts from betterment will amount to £4,750,000, making the ultimate nett cost of the improvement, after deducting recoupment, considerably less than the original estimate of £774,200.

Bournemouth Improvements. — Municipal buildings are to be erected in Bournemouth at an estimated cost of £70,000, exclusive of a sum of £14,000 for the site. The town council has also decided to consider schemes for the preservation of the cliffs and the construction of an undercliff drive at an estimated expenditure of £58,000, as well as the purchase of the Belle Vue Hotel site, near the pier, at a cost of £60,000, on which to erect a kursaal or pavilion.

CLERKS OF WORKS ASSOCIATION.

THE twenty-second annual dinner of the Incorporated Clerks of Works Association of Great Britain was held on Saturday evening at the Criterion Restaurant, Piccadilly. Mr. J. S. Gibson, F.R.I.B.A., presided over a company of 330. After the loya toasts had been given, Mr. John Davie proposed "The Architects and Surveyors," i doing which he cited a very ancient document wherein it was stipulated that if building fell and killed a man the builde should be put to death; in those days ther were no architects or clerks of works or surveyors, and jerry-building was not unknown To-day the architect had a glorious opportunity of embodying the sentiment and purpos of the nation in wood and stone. Mr. Willia Woodward, A.R.I.B.A., replied. Referring t the ancient document in question, he mentioned a further provision that defectiv walls should be strengthened by the builde "at his own expense" to meet the requirements. Nowadays the architect had a tas before him in meeting the multitudinou requirements—more particularly those of th gentlemen at Spring Gardens, then of th borough council, then of the district surveyor, and still further requirements of th adjoining owner. But the architect undoubtedly had a great opportunity. Th "arty architects" had now had their day, an the style of architecture which commende itself to the public would claim to last lik the styles of the mediæval centuries. The had with them that evening Mr. Sidne Young, who held one of the most honourabl positions among quantity surveyors: i which connection Mr. Woodward expresse the opinion that a thorough knowledge o quantities was of excellent service to th architect, who also should take advantage any suggestions that might be made b clerks of works and builders' foreme whose practical knowledge would ofte result in improvements being made in th specifications, and even in the design itsel Mr. J. Aitchison proposed "The Worshipfu Company of Carpenters," to which Mr. Hutton Freeman (clerk to the Company replied. The chairman then proposed th toast of the Association, which, he observe was founded and carried on for intercours to enlarge experience, and to obtain employment for its members; moreover, a benevolent fund was mooted and also a librar It was incorporated in 1882, and now had membership of about 150. Mr. W. Pit (president of the Association) replied to th toast. Other toasts were "The Press, "The Visitors" (proposed by Mr. A. Fincha and responded to by Mr. John C. Hill, of th London Brick Co., and Mr. J. Carmichae president of the London Master-Builder Association) and "The Chairman," propose by Mr. D. W. McInnes.

Current Market Prices.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0	1	17	0
Clover, best	per load	3	15	0	4	5	0
Hay, good	do.	3	10	0	3	17	0
Sainfoin mixture ...	do.	3	10	0	3	17	6
Straw	do.	1	12	0	2	2	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ...	per cwt.	1	0	5		—	
Colza Oil, English ...	do.	1	1	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0		—	
Linseed Oil, barrels ...	per cwt.	0	15	3		—	
Petroleum, American ...	per gal.	0	0	$5\frac{1}{4}$	0	0	$5\frac{3}{8}$
Do. Russian ...	do.	0	0	$4\frac{3}{4}$	0	0	$4\frac{7}{8}$
Pitch	per barrel	0	8	0		—	
Shellac, orange	per cwt.	7	10	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	4	6		—	
Tar, Stockholm	per barrel	1	5	0		—	
Turpentine	per cwt.	1	17	3		—	

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ...	per ton	80	0	0		—	
Iron, Staffs., bar ...	do.	5	15	0	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	5	0	10	10	0
Lead, pig, Soft Foreign...	do.	12	11	3	12	12	6
Do. do. English common brands	do.	12	17	6		—	
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14	0	0		—	
Do. pipe	do.	15	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	5	0		—	
Do. floor brads... ...	do.	9	0	0		—	
Steel, Staffs., Girders and Angles	do.	5	10	0	6	0	0
Do. do. Mild bars ...	do.	6	0	0	6	5	0
Tin, Foreign	do.	130	7	6	130	17	6
Do. English ingots ...	do.	130	15	0	132	10	0
Zinc, sheets, Silesian ...	do.	28	0	0		—	
Do. do. Vielle Montaigne	do.	29	0	0		—	
Do. Spelter	do.	24	17	6	25	2	6

TIMBER.

Soft Woods.

		£	s.	d.	£	s.	d.
Whitewood, American, logs.	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	3	0
Fir, Dantzic and Memel	per load	2	7	6	4	15	0
Pine, Quebec, Yellow ...	do.	4	5	0	7	5	0
Do. Pitch, American...	do.	2	8	0	5	15	0
Laths, log. Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, Archangel, White, 2nd, 3×11	per std.	10	0	0		—	
Do. do. do. do. 3×9	do.	9	10	0		—	
Do. Sandarne Yellow, 3rd, 3×9	do.	12	10	0		—	
Do. do. do. do. 2½×9	do.	12	5	0		—	
Do. Kovda Yellow, 3rd, 3×9	do.	11	5	0			
Do. Kallskar Yellow, 5th, 3×9	do.	9	5	0		—	
Do. Petschora, Yellow, 2nd, 3×9	do.	13	10	0		—	
Do. Mesane, Yellow, 4th, 3×9	do.	8	5	0		—	
Do. Skutskar, Yellow, mixed, 3×8	do.	11	10	0		—	
Do. do. do. 3rd, 3×8	do.	10	0	0		—	
Do. Sundsvall, Yellow unsorted, 2½×7	do.	9	5	0		—	
Do. Stugsund, Yellow, 5th, 2½×7	do.	8	10	0	8	15	0
Do. West Bay, N.S., Spruce, 1st, 2nd & 3rd, Unsorted, 3×11	do.	8	0	0		—	
Do. do. do. do. 3×10	do.	7	15	0		—	
Do. do. do. do. 3×9	do.	8	0	0	8	5	0
Do. do. do. do. 3×8	do.	7	5	0	7	10	0
Do. do. do. do. 3×7	do.	7	5	0		—	
Do. do. do. do. 2½×7	do.	7	5	0		—	
Battens, all kinds ...	do.	6	5	0	13	10	0
Flooring Boards 1in. prepared, 1st... ...	per square	0	9	0	0	11	0
Do. 2nd	do.	0	8	3	0	10	3
Do. 3rd, &c.	do.	0	6	6	0	9	3

Hard Woods.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	4	0	0	7	10	0
Birch, New Brunswick...	do.	2	10	0	5	5	0
Do. Quebec do. ...	do.	2	10	0	6	0	0
Box, Turkey	per ton	7	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	$3\frac{1}{2}$		—	
Do. Honduras ...	do.	0	0	$5\frac{7}{32}$		—	
Do. Tobasco	do.	0	0	$5\frac{3}{32}$		—	
Elm, Quebec	per load	4	2	6	8	15	0
Jarrah, planks	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras...	per ft. sup.	0	0	$4\frac{13}{16}$		—	
Do. African ...	do.	0	0	$3\frac{11}{32}$		—	
Do. St. Domingo	do.	0	0	4		—	
Do. Cuba ...	do.	0	0	$6\frac{1}{4}$		—	
Do. Lagos ...	do.	0	0	$4\frac{7}{32}$		—	
Do. Benin ...	do.	0	0	$2\frac{21}{32}$		—	
Do. Tobasco ...	do.	0	0	$4\frac{31}{64}$		—	
Oak, Wainscot	per log.	2	12	6	5	15	0
Do. American quartered, planks and boards	per ft. cu.	0	2	6	0	5	0
Do Dantzic & Stettin	per load	3	0	0	6	10	0
Do. Quebec	do.	4	15	0	8	0	0
Teak, Rangoon, planks...	do.	8	0	0	15	10	0
Do. Indian logs ...	do.	10	0	0	18	10	0
Do. Indian planks ...	do.	13	0	0	20	0	0
Do. Moulmein logs ...	do.	6	10	0	8	0	0
Kauri pine logs	per ft. cu.	0	1	6	0	2	0
Do. do. planks ...	do.	0	3	0	0	3	6

USHER HALL, EDINBURGH.

The Usher Hall, Edinburgh, continues to be the subject of much consideration. The special committee of the Edinburgh Town Council discussed the scheme for four hours on Tuesday last week. The whole question has now been narrowed down to the clear issue as to whether the hall shall be proceeded with, according to the modified plans, on the site of the Synod Hall, or whether the latter building shall be retained as at present. Sir Aston Webb and Dr. F. H. Cowen have been requested to prepare a report on the acoustics of the proposed hall.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, Builders' Journal, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless thev contain the name of the Architect or Surveyor for the work.

Brentwood.—For rebuilding the "Queen" inn. Mr. Herbert Riches, architect, 3, Crooked Lane, King William Street, London, E.C. :—

Dowsing & Davies...	£1,010	0	0
Clemens Brothers	1,005	10	0
T. Osborn & Sons...	925	0	0
F. W. Bartwell*	903	0	0

* Accepted.

Deri, Cardiff.—For the erection of thirty-two houses, for the Deri No. 2 Building Club Mr. P. Vivian Jones, P.A.S.I., architect, Hengoed :—

R. Tudor, Abertillery...	£8,832	10	0
R. Lloyd, Merthyr	8,240	0	0
E. P. Davies, Dowlais...	7,648	0	0
Morris & Co., Bargoed	7,616	0	0
D. Williams, Bargoed...	7,552	0	0
Jewell & Davies, Deri	7,452	8	0
W. W. Davies,* St. Mary Street Cardiff	7,200	0	0
W. Bowen & Co., Barry Dock ...	7,200	0	0
Ruddiford Brothers, Blaina	7,068	0	0
M. Gibbon, Cardiff	7,050	0	0
Vodden & Lee, Pengam	6,912	0	0
J. Lloyd, Ystrad Mynach	6,800	0	0

* Accepted.

East Ham.—For the enlargement of Manor Park School, for the East Ham Education Committee :—

Almond & Sons, Ltd., Ponder's End... ...	£8,100
J. Chessum & Sons, Bow	7,700
J. Gregory, Manor Park...	7,601
Holliday & Greenwood, Ltd., Loughborough Park Works, Brixton	7,587
B. E. Nightingale, Lambeth...	7,528
Stimpson & Co., Battersea	7,500
H. J. Carter, Grays	7,357
C. North, Stratford	7,347
J. W. Jerram, East Ham	7,298
F. & A. Willmott, Ilford	7,297
A. E. Symes, Stratford	7,202
W. Gregar & Son, Stratford...	7,200
H. C. Horswill, Forest Gate...	7,199
J. S. Hammond & Son, Romford	6,959
W. J. Maddison,* Clarkson Street, Canning Town, E.	6,829

* Accepted.

Helston (Cornwall).—For the erection of a secondary school in Penrose Road, for the Cornwall Education Committee :—

Richards & Frezise	£1,41[illegible]
W. J. Winn,* Helston	1,[illegible]5

* Accepted.

London, N.W.—Accepted for alterations and extensions to Paddington Town Hall :—

B. E. Nightingale	£12,342

London, S.E.—For the construction of underground conveniences for men and women in Great Dover Street, for the Southwark Borough Council. Mr. A. Harrison, A.M.I.C.E., borough surveyor :—

Shelbourne & Co., Fenchurch Street ...	£3,532
B. Finch & Co., Lambeth	3,327
G. Jennings, Ltd., Lambeth...	3,080
Doulton & Co., Lambeth	2,790
J. Parsons, Waterloo Road	1,764
Thomas & Edge, Woolwich	2,683
R. & E. Evans, Peckham	2,595
Foster Brothers, Norwood Junction... ...	2,516
Chambers Brothers, Ealing	2,434
Wisdom Brothers,* Isleworth	2,375

* Accepted.

Merthyr.—For the erection of stabling, lofts, &c., with boundary walls and outbuildings. Mr. Arthur Marks, architect, Merthyr Express Chambers, Merthyr Tydfil :—

W. Watts, Brynheuloy, Dowlais ...	£1,435	10	0
J. Jenkins	1,420	0	0
J. Williams	1,375	0	0
E. L. Sullivan	1,259	0	0
W. C. Jones	1,247	0	0
R. Lloyd,* Georgetown	1,180	0	0

Architect's estimate, £1,333 12s. [Rest of Merthyr.]

* Accepted.

Newcastle-upon-Tyne.—For the erection of new school buildings at the Newcastle-upon-Tyne Royal Grammar School. Messrs. Russell & Cooper, architects, Gray's Inn Square, W.C. :—

S. Fenwick & Co.	£30,472	0	0
D. & J. Ranken, Sunderland	27,111	0	0
J. L. Miller, North Shields	26,503	5	0
G. H. Mauchlen	26,201	1	6
J. Howe & Co., West Hartlepool ...	25,814	8	0
T. Weatheritt	25,664	0	0
S. Easten	25,351	0	0
W. T. Weir, Howdon, near Newcastle-upon-Tyne	25,302	0	0
J. C. Hope	25,277	3	11
S. Sheriff & Sons, South Shields ...	25,251	17	1
S. F. Davidson	25,228	15	7
J. & W. Lowry	25,108	0	0
E. Weatherley	25,085	10	0
T. Lumsden, Jarrow	24,922	0	0
W. Worley, junr.	24,752	1	11
I. Bewley, Dunston-on-Tyne	24,502	8	2
Elliott Brothers	24,349	15	1
Watt Brothers, West Hartlepool ...	24,318	18	8
A. Pringle, Gateshead	24,307	0	0
Smith Brothers, Ltd., Burnley ...	24,275	0	0
J. C. Ferguson	24,205	3	8
Armitage & Hodgson, Leeds	24,146	0	0
Nicholls & Co., Gateshead	24,072	15	0
W. Foster, Pelaw, co. Durham ...	23,980	0	0
J. W. Braithwaite & Co.	23,496	3	8
T. Hunter, Washington, co. Durham	23,450	14	2
Middlemiss Brothers	23,256	12	9
T. Riley, Fleetwood	22,959	15	1
J. Parkinson & Sons, Ltd., Blackpool and Newcastle	22,912	2	4
H. Arnold & Son, Doncaster	21,871	13	5

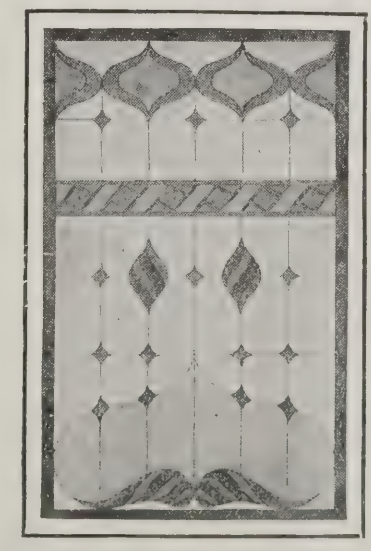
[Rest of Newcastle-upon-Tyne.]

Oxford.—For the erection of a cricket pavilion in Cowley Road, for Jesus College. Mr. R. England, Oxford, estates surveyor to the College :—

S. Hutchins & Sons	£1,375
T. H. Kingerlee & Sons,* Oxford	1,265

* Accepted.

(*Continued on p.* xxiv.)



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TENDERS—*cont. from p.* xxiii.

London, N.W.—For the erection of proposed block of working-class dwellings in Lower Cross Road, for the Hampstead Borough Council :—

Mattock & Parsons	£13,356
Hudson & Co.	12,589
Martin, Wells & Co.	12,560
Wallis & Son	12,273
Perry & Co.	12,100
Nightingale	11,936
Johnson & Co.	11,900
Knight & Son	11,895
Patrick	11,889
Applebee & Sons	11,800
Cowley & Drake	11,644
C. Wall, Ltd.	11,568
Saunders	11,489
Lawrence & Son	11,484
Gutteridge	11,480
J. Parsons	11,355
Davy & Jones	11,356

[These tenders have been referred to the Housing Committee.]

Rochester.—Accepted for the repair and restoration of the organ in the cathedral, for the Dean and Chapter :—

J. W. Walker & Sons, London	£1,500

Shorncliffe Camp.—For the erection of a new post-office, for H.M. Office of Works, &c. :—

J. J. Wise	£2,296	0	0
J. Gosby	2,221	13	9
F. Nicholls	2,200	0	0
T. L. Fearon	1,990	6	0
E. J. Logan	1,949	0	0
R. Gravling	1,920	0	0
T. T. Denne	1,893	0	0
East & Hyde	1,852	0	0
G. H. Denne & Son	1,850	0	0
Gann & Co.	1,774	0	0
Newton White	£1,745	0	0
G. Castle & Son	1,699	16	0
G. E. Wallis & Sons, Ltd.	1,694	0	0
G. Browning	1,669	0	0
R. Webster	1,450	0	0

Sutton-in-Ashfield.—For the erection of the New Market Hotel in the Market-Place, for the Home Brewery Co., Ltd. Mr. Fred C. Martin, architect, Angel Row, Nottingham :—

J. Keeling	£2,811
A. Eastwood & Co.	2,600
C. Vallance	2,280
F. Messom	2,180
J. H. Vickers	2,175
C. J. Percival	2,170
J. Greenwood	2,149
Evan Brothers	2,070
W. Maule & Co.,* Nottingham	2,030

* Accepted.

Wothorpe, Stamford.—For the erection of a residence, cottage, stables, &c., for Mr. H. V. Cobbold. Messrs. J. G. Stallebrass & Sons, architects and surveyors, North Street, Peterborough. Quantities by the architects :—

Bowman & Sons	£2.999	0	0
J. Peasgood	2,993	12	6
G. H. Eastwood	2.979	0	0
J. Woolston	2,955	0	0
Hinson & Co.	2,872	10	0
Roberts Brothers	2,835	0	0
G. Henson	2,815	0	0
Thurley Brothers	2,802	8	2
J. Lucas	2,785	0	0
Kettering Co-operative Builders, Ltd.	2,744	0	0
Storer Brothers	2,705	0	0
J. Bridgefoot & Son	2,704	1	2
R. Shanks	2,685	0	0
J. Parker	2,683	16	6
Nichols Brothers	£2,674	19	0
Hipwell & Co.	2,672	0	0
J. Guttridge	2,621	3	5
H. Watson	2,600	0	0
D. Gray	2,578	9	0
Siddon & Freeman,* Oundle	2,550	0	0
A. Lindsay	2,472	0	0

Accepted.

Woolwich.—For reinstating the Royal Artillery Theatre after the fire, with alterations and additions. Mr. W. G. R. Sprague, architect, Criterion Chambers, 10 and 11, Jermyn Street, S.W. Quantities by Mr. A. R. Henderson, surveyor, 47, Pall Mall, S.W. :—

Patman & Fotheringham	£8,500
G. Longden & Son	8,300
Henry Lovatt	8,000
Walter Wallis	7,990
Perry & Co.	7,978
Harris & Wardrop	7,844
C. F. Kearley	7,594
G. Munday & Son	7,381
C. Gray Hill	7,350
W. H. Lorden & Son	7,169

London, S.W.—For the erection of a new post-office at Chelsea, for H.M. Office of Works, &c. :—

				Alternative tender for Shamrock stone.	Credit old materials.
A. J. Colborne	£13,900	0	0	£13,790	—
J. Christie	13,645	10	0	13,528	£50
G. H. Gibson	13,585	0	0	13,500	—
G. Ansell	13,499	0	0	13,431	—
E. Triggs	13,188	0	0	13,188	—
W. J. Renshaw	12,971	0	0	12,871	—
J. Ferguson & Co.	12,898	0	0	12,873	30
E. P. Bulled & Co.	12,756	0	0	12,704	58
Lole & Co.	12,724	0	0	12,694	50
H. J. Williams, Ltd.	12,647	0	0	12,567	—
Stimpson & Co.	12,460	0	0	12,442	60
J. Mowlem & Co., Ltd.	12.448	0	0	12,326	—
Foster Brothers	12,438	0	0	12,438	—
J. Appleby & Sons	12,327	0	0	12,227	50
Cropley Brothers, Ltd.	12,293	0	0	12.310	—
Leslie & Co., Ltd.	12,223	0	0	12,100	10
E. Lawrance & Sons	12,158	0	0	12.043	—
W. Johnson & Co., Ltd.	12,138	0	0	12,013	—
W. Willett	12,134	0	0	12,022	—
Martin, Wells & Co., Ltd.	12,000	0	0	12,015	—
Banyard & Son	12,000	0	0	11,873	—
J. Smith & Sons, Ltd.	11,989	0	0	11,960	—
Perry Brothers	11,800	0	0	11,700	—
L. Whitehead & Co., Ltd.	11,778	0	0	11,678	—
W. H. Lorden & Son	11,749	0	0	11,630	—
Mattock & Parsons	11,650	0	0	11,550	—
W. Norton	11,514	0	0	11,814	—
Wisdom Brothers	11,500	0	0	11,380	20
C. Wall, Ltd.	11,400	0	0	11,292	—
J. Shelbourne & Co.	11,275	0	0	11,165	—
B. E. Nightingale	11,105	0	0	11,117	—
Galbraith Brothers*	10,990	0	0	10,985	—

* Accepted.

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SLATE SLAB GOODS:
Both Plain and Enamelled.
ALFRED CARTER & CO., LIVERPOOL.

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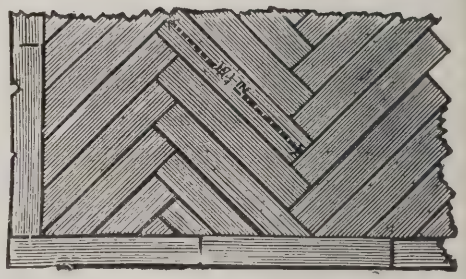

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17¼ × 3 × 2	8 3	7 9	11 5
17¼ × 3 × 1½	6 9	6 3	9 0

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MONTHLY

FIRE SUPPLEMENT

TO THE

BUILDERS' JOURNAL AND ARCHITECTURAL RECORD.

Edwin O. Sachs, F.R.S.Ed., Architect,
Consulting Editor.

Number 4.
February, 1905.

SUMMARY.

There has been an epidemic of country-house fires during the last eighteen months, but householders would do better to take no advice at all and be guided by common-sense alone than be stupidly lulled into a sense of security by incompetent and unreliable advisers. (Page 55.)

The London Building Acts Amendment Bill requires some modifications in order to give London an up-to-date and workable enactment, but with a little "give-and-take," and a little tact with regard to the additional control sought by the London County Council on the administrative side, the promoters' wishes may be met to a very considerable extent to their credit and to the benefit of the metropolis. (Page 52.)

A new combined motor fire appliance has been provided for the Finchley Fire Brigade that is practically a combined chemical engine, fire engine and fire escape, and is self-propelled. (Page 60.)

A National Board of Fire Underwriters has been established in the United States with the object of influencing the introduction of improved and safe methods of building construction, encourage the adoption of fire-protective measures and secure efficient organization and equipment of fire departments, with adequate and improved water systems. (This page.)

The fire losses in the United States and Canada during 1904 were greater than in any year since 1871, when the great destruction at Chicago made a record which can hardly be reached again. (Page 57.)

The London Fire Brigade has now 927 public electric alarm-points in addition to 264 telephone lines to police-stations, public and other buildings. From most of the alarm-points telephonic communication can be at once established with a police-station. (Page 50.)

By the fire tests of the British Fire Prevention Committee, London has been saved from the introduction of many a material and appliance, generally of foreign origin, which unscrupulous vendors have tried to foist upon a public without ascertaining its merits at an official testing station. (Page 56.)

NATIONAL BOARD OF FIRE UNDERWRITERS.

Its "Committee of Twenty"; The Work in Hand.

THE following particulars regarding the National Board of Fire Underwriters of the United States show the progressive spirit with which the leading insurance men in America are now dealing with the question of fire loss from the only properly possible aspect, namely, that of systematic and scientific "fire prevention." We are pleased to note that many of our British insurance companies are represented on the Board and participate in its work through their local officers, and further contribute towards the expenses.

The Board is composed of 120 of the leading fire insurance companies doing business in the United States, and, as set forth in the organization papers, its purpose is to influence the introduction of improved and safe methods of building construction, encourage the adoption of fire protective measures and secure efficient organization and equipment of fire departments, with adequate and improved water systems. The Board has no control over rates of insurance, commissions of agents, &c.

Knowing that the fire waste in the United States greatly exceeds that of other countries, and believing that the Baltimore conflagration would impress upon the public the danger to most, if not all, of our great cities of a like disaster, it was decided to appoint a committee charged with the duty of organizing an engineering department composed of men standing high in their profession and through them to investigate conditions, stating facts as to those existing and making recommendations for improvements that would minimize the sweeping fire or conflagration hazard, especially in the congested or heavy value districts of the cities visited. Accordingly, a staff of engineers has been organized, and to-day there are in the field four parties, each collecting data in some different city, the work being carried on by men who have had experience in civil, mechanical, structural, hydraulic and electrical engineering.

The entire work of the Committee is under the direct supervision of Mr. Herbert Wilmerding as secretary. Mr. Wilmerding has for many years been a close student of the relation between fire insurance and municipal departments, especially in reference to building construction and fire hazards. His work with the Philadelphia Underwriters' Association and elsewhere afforded exceptional opportunities for an intelligent study of the relations between underwriters, architects and engineers in the conduct of municipal work. His study of conflagrations and congested districts has been very broad, both from a logical analysis of conditions presented in the congested districts of cities and from object-lessons derived from past conflagrations.

The Federal Government has detailed two engineers of the United States army to investigate and review the reports of each city, it being the desire of the underwriters that the reports might have final supervision and be criticized by men in no way connected with the business of fire insurance and having no reason for endorsing a report that stated other than the facts and asked for improvements and changes that were not in the interest of the public.

A sweeping fire or conflagration is a terrible calamity, and, occurring in one of their greater cities, would wipe out several hundred million dollars of property values, causing no doubt a great panic from which all of the people of the United States would suffer. It should be borne in mind that, while the insurance companies reimburse the actual sufferer by the fire, the people as a whole bear the burden, and unless the people pay enough for the companies to meet the claims for fire losses, they, the companies, would soon be forced into bankruptcy.

It is a mistaken idea that payment by fire insurance companies makes good the property loss, for property burned is value wiped out of existence, and the insurance companies merely distribute the loss by collecting in small sums premiums from all the property owners and paying in large sums to those who suffer loss by fire.

Property burned is money wasted, and the people of the United States are the most wasteful in the world in this direction. Fire losses being the barometer of insurance rates, it is of interest to note that, according to the statistics collated from the reports of the Superintendent of Insurance of the State of New York for the year 1903, the average rate of premium charged throughout the United States was 1·19 dols. per 100 dols. on the sum insured, while in Great Britain, where high buildings, large areas, poor flues and shoddy construction are prohibited by law, the average rate of premium is about 9 cents; and in Italy, where the construction is still better and the conflagration hazard practically eliminated, the rate is only 6 cents per 100 dols.

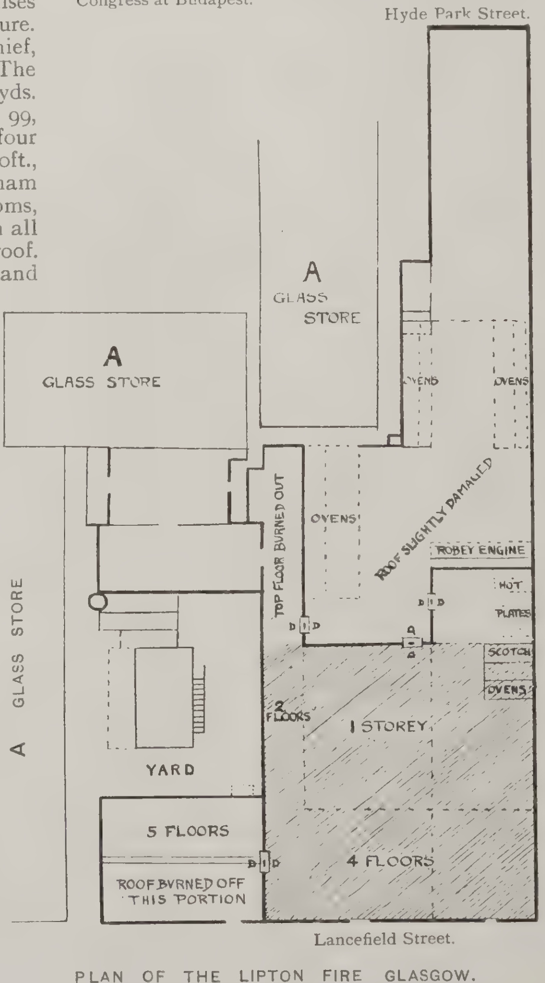
The seriousness of the conflagration danger in American cities is realized by business men generally, and the reception of the reports of the Committee of Twenty of the National Board by municipal authorities and property owners is sure to be a most favourable one. It is earnestly hoped that it will be generally realized that the fire underwriters have no desire to dictate, but intend rather to put facts before those interested, hoping and believing that the result may be beneficial to all concerned.

THE LIPTON FIRE AT GLASGOW: GENERAL VIEW.

A GLASGOW FIRE.

THE following is a report of the fire in Messrs. Lipton's, Ltd. premises, 93 to 99, Lancefield Street, Glasgow, which occurred at 2.58 a.m. on Tuesday, January 13th last:—An employee from Messrs. F. & B. Stevenson's Cranstonhill Bakery, situated in Cranston Street and overlooking Lancefield Street, reported at the Western District Fire Station that he observed a fire, apparently a hoarding, in Lancefield Street. The brigade immediately turned out, and it was seen that the outbreak was in the extensive premises of Messrs. Lipton, Ltd., and of a serious nature. Assistance was at once called out from chief, northern and southern district stations. The western station is situated within 300 yds. of Messrs. Lipton's premises, Nos. 93 to 99, Lancefield Street. A stone building four storeys in height, measuring 110ft. by 60ft., occupied as general provision stores, ham smoking chambers and despatching rooms, was on arrival of the brigade alight on all floors and the fire showing through the roof. This building was completely gutted and the frontage to Lancefield Street fallen in. Adjoining to the north is a building of five floors, 50ft. by 60ft., which communicates with the south block on ground and upper floors by means of openings in gables protected on ground floor only by double iron doors. There is a stone staircase 4ft. 6ins. wide which serves both buildings.

The north building is occupied as general stores, dining-rooms, ticket-writing and stationery departments, ham and bacon curing and mechanics' shops. The fire spread to the upper floor and the roof of the building by an opening which was fitted with a single iron door which was only partially closed. In the result the half of the top floor was pretty well burned out and half of the roof destroyed. Adjoining to the east of the gutted building, and communicating therewith, is a range of buildings partly one and partly two storeys high measuring 110ft. by 100ft., occupied as tin washing and drying-rooms, sausage factory and packing rooms, which are completely destroyed. Abutting upon these buildings is the bakery, the roof of which was slightly damaged.



PLAN OF THE LIPTON FIRE GLASGOW.

FIRE CALLS AND ALARMS.*

By JAMES SHEPPARD, A.Inst.E.E.

THE great importance of subduing outbreaks of fire at their earliest inception has been and still is universally acknowledged. In times when effective appliances for extinguishing fires were not available some attention was given to precautions intended to guard against the outbreak of fire and to prevent it spreading rapidly. All fires and lights were required to be extinguished on the ringing of the curfew bells at an early hour of the night. At a later date special patrol

Watchmen

were appointed and authorized to caution all citizens to be careful with fire and light. Walls of stone 3ft. thick were required to be built between adjoining houses as barriers to the spread of fire, and the practice of dangerous trades in districts congested with buildings, was prohibited.

In many cities watchmen were stationed on high towers to look out for and give an alarm of any fire they might discover, indicating its locality by flags or lights, some improvement on which method was shown by the use of plans or charts of the town upon which the intersection of sight lines was noted, indicating more definitely the locality of a fire, the information thus obtained from the tower being lowered to the watchman at the street level. In some cities this practice of keeping a watch for fires on high towers still continues.

Bells

were provided in church towers or on public buildings to give alarms and call help when fires were discovered. One such bell in the abbey church at Sherbourne, Dorset, bears the motto dated 1652:

> "Lord quench this furious flame.
> Arise, run, help, put out the same."

The foregoing arrangements for discovering and giving alarms of fire could not have been satisfactory, as it is clearly important to have notice of the outbreak of a fire before any light it might give could be discovered from a distance, and these regulations do not appear to have inspired much confidence, for we find that in London in 1553, and again in 1605, royal proclamations were issued against the erection of further buildings "for avoiding of the rage of fire."

The various precautions referred to appear to have been frequently evaded or altogether neglected; at any rate they did not effect the object in view, for during mediæval times many cities and towns experienced sweeping conflagrations, and in 1666 the greater part of London was destroyed by fire. After this disaster more stringent precautions were adopted; a special fire-watch and bell men were appointed and all constables were authorized to make enquiry twice a year "of the security of hearths, ovens and stoves and places for laying fire ashes in," a very wise provision which might again be enacted and extended with great public advantage.

Rewards for Quick Attendance.

On the general introduction of fire engines with hose about the year 1700, the necessity of early attendance with the engines at the scene of the fire was fully recognized. Having this in view, rewards were authorized to be paid to the amount of 30s. to the keeper of the first engine to arrive, 20s. to the second, and 10s. to the third, and the turncock who first provided water from the mains for the use of the engines was paid 10s. The engine keepers and turncocks shared these rewards with persons who first gave them information of the outbreak of fire, and thus established the system of fire calls by runners or messengers which continued in London for about 170 years, and is still in force in many provincial districts. This system of rewards obviously lent itself to serious abuse, and it was found that many fires were started with the sole object of obtaining the call money.

As the result of any enquiry made in 1871 no fewer than seventy-four fires which occurred during eight months in London were found to have been started by one man, who under different names and addresses received the call money. Shortly after this the payment of rewards for fire calls was discontinued.

The application of the electric telegraph made it possible to dispense with calls by messengers or other means, and the use of telegraphic fire-alarms gradually superseded previous methods of giving calls to fire brigades. The first complete system of

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* A paper read before the 1904 International Fire Congress at Budapest.

Public Electric Fire-alarms

was provided in connection with police-stations in Berlin in 1849. Other cities experimented and after a time adopted similar systems of alarm signals.

The fear of false alarms, either from defects in the equipment or from malice, delayed general approval of public electric alarms, and they were not adopted in London until 1880, when forty call points on six circuits were provided, from which in that year forty-four good calls were received and thirty-three false alarms, but only in one instance was a person detected in tampering with the alarm.

The London Fire Brigade has now 927 public electric alarm points in addition to 264 telephone lines to police-stations, public and other buildings. From most of the alarm points telephonic communication can be at once established with a police-station.

Since the fixing of

Electric Call Points

n the streets of London the proportion of alse alarms has increased from about 7 per ent. of all calls for fires to about 20 per cent., out notwithstanding this the system is admitted to be indispensable and of good ublic utility. Malicious alarms now show marked decrease, the number of these eported in 1903 being 126.

Various arrangements are made in different ities to guard against the abuse of electric all points, but all tend to cause delay and nay prove the greater of two evils.

As an addition to the public electric fire-alarm call boxes, numerous call points are now provided on the different floors of large establishments in American cities, and probably in some cities of other countries, connected with the nearest public alarm-box, through which alarms can be sent direct from various parts of the building so equipped to the fire-brigade stations or to a central depôt in telephonic communication with the brigade.

Wireless telegraphy has also been used for fire-alarm purposes and may prove of value in special circumstances.

Automatic Alarms.

All the systems above referred to rely on some person discovering an outbreak of fire and operating the alarm. They are known, therefore, as manual alarms. These have been found to be generally satisfactory, especially in connection with an organized fire watch.

Many efforts have been made in the past to secure an automatic alarm operating by an undue increase of temperature in any part of a building, thus announcing the outbreak of fire, but these devices were not found to be permanently reliable. In more recent years, however, renewed efforts have been made, with every prospect of success.

With automatic sprinkler installations the provision of alarms operating on the opening of a sprinkler head, whether from heat or leakage, is indispensable. In other systems, any of which can be used in connection with sprinklers, devices known as heat detectors or thermostats are distributed over all parts of the building to be protected. Any one of these is based on an increase of temperature up to a determined point; it makes or breaks an electric circuit, and transmits an alarm to any point desired, indicating the building, floor or room from which the alarm is given.

Devices Employed.

Various applications of the law governing the changes of different substances under the action of heat have been devised for securing the desired end, such as the melting of specially prepared solder, the expansion of or changes in springs or rods of metal, or of mercury in tubes, the expansion of air operating an elastic metal diaphragm, air-pressure or vacuum release, the expansion of liquids breaking slight glass bulbs, and the elongation of wire. In a device recently introduced the elongation of wire and the release of air under pressure are used in combination, both for giving an alarm and for opening the main valve of a sprinkler installation, the sprinkler heads being opened by a similar but distinct wire elongation. The alarm can be given at any point required by an automatic electric current.

In many cases automatic fire-alarms are maintained and controlled by the companies supplying them, all alarms being received by officers of the companies at the fire station or at separate central stations, from which they are transmitted by telephone to the fire station with full particulars as to locality. This latter arrangement is followed in London, a fine of £10 being payable if a false alarm is given.

The various systems may be said to be still on their trial. The outcome will be the survival of the fittest.

The foregoing remarks apply more particularly to Great Britain, but it will be found that the practice and experience has not differed in other countries to any great extent, except that in some cases improved methods were adopted at an earlier date than in Great Britain.

The advantage gained by a fire brigade

THE LIPTON FIRE AT GLASGOW: INTERIOR VIEW.

receiving the earliest possible notice of an outbreak of fire cannot be over-estimated, and any system which secures this in a reliable manner will be a distinct public benefit. The National Convention of Fire Chiefs of the United States unanimously resolved at their meeting in 1871 that a thorough and efficient system of telegraphic fire-alarms giving early and definite information of the existence and locality of a fire is of primary importance to the fire department of every city and town, which resolution will doubtless receive universal approval.

Importance of Planning and Construction.

While fully acknowledging the supreme importance of early alarms of fire, it is desirable at the same time to emphasize the equal importance of planning, constructing and protecting commercial and other buildings, both internally and externally, so as to check the rapid spread of fire, and thus afford fire brigades reasonable opportunity of preventing conflagrations. Experience has repeatedly shown the necessity of this, even in cases where the premises involved have been installed with sprinklers or automatic alarms.

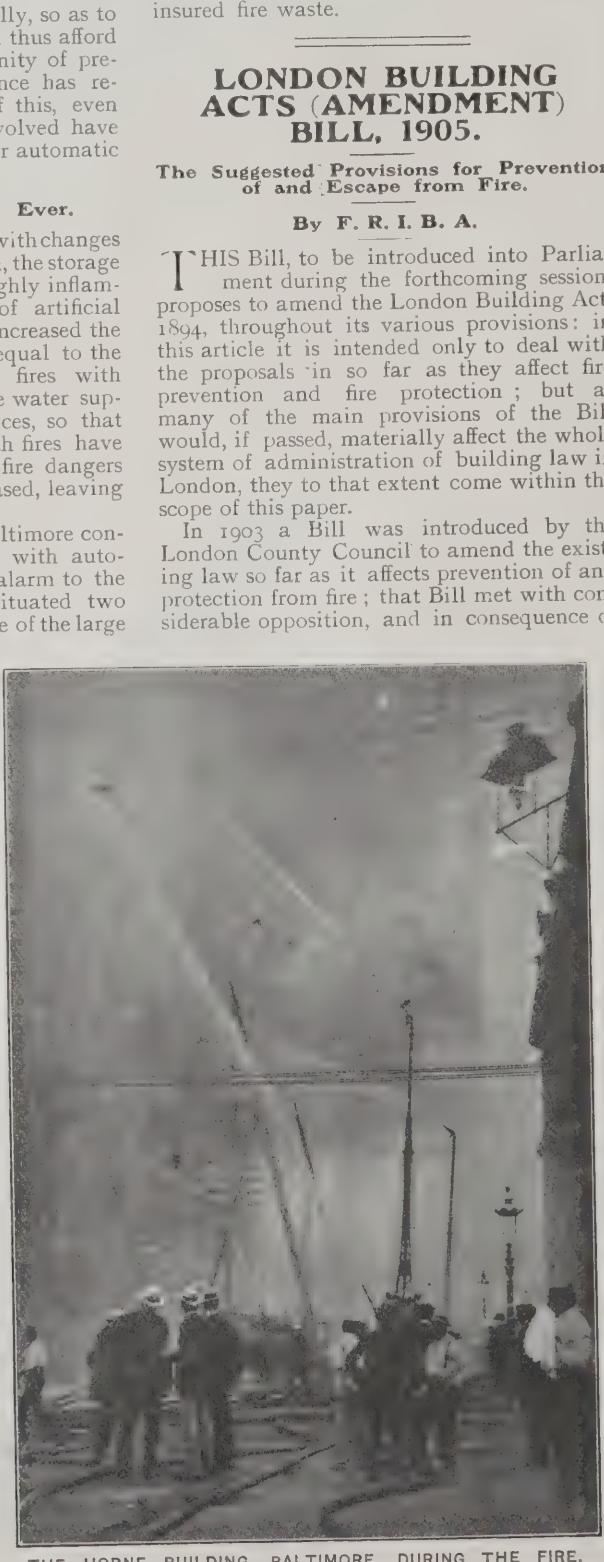
Fire Dangers as Great as Ever.

The concentration of businesses, with changes in the manner of conducting them, the storage and general use of new and highly inflammable substances, new modes of artificial lighting and other causes, have increased the fire dangers to an extent fully equal to the improved methods of fighting fires with automatic fire-alarms, up-to-date water supplies and extinguishing appliances, so that while facilities for dealing with fires have been enormously increased the fire dangers have also correspondingly increased, leaving the nett gain practically nil.

The building in which the Baltimore conflagration originated was fitted with automatic fire calls which gave an alarm to the Fire Patrol and Engine Co. situated two blocks distant, but in consequence of the large undivided area of the building, the existence of wide openings through all floors from basement to roof, and wood linings to walls and ceilings, the early call was of no avail.

The great danger constantly present where large warehouses filled with combustible goods (like the Hurst building at Baltimore) are in proximity to each other has been often referred to. Twenty years back Captain Shaw published the following remarks on the subject: "At the present rate of progress the day cannot be far distant when firemen may be compelled to say that they are unable to deal with the vast masses of property which merchants insist on bringing together within one risk; but it is hard on a fireman to have to own himself beaten, even when he knows he is, and it is still possible that in the end the quantity of stock massed together in one risk will be limited not by the warning or appeal of firemen but by the self-interest of merchants when they find insurance rates prohibitive."

Since the foregoing was written its truth has been shown by the costly experience of many cities.



THE HORNE BUILDING, BALTIMORE, DURING THE FIRE.

BALTIMORE.

In a fire supplement of this description it is impossible not to make some reference to the Baltimore conflagration on the first anniversary of its occurrence. We dealt with this terrible fire at some length, with illustrations, in our first supplement of November 23rd, 1904, and on this occasion we, by way of reminder, are presenting two illustrations indicating the terrors of this outbreak.

Earlier in this supplement we present the eminently interesting particulars regarding the National Board of Fire Underwriters' intentions to examine into the fire risks of various American cities, which particulars at the same time throw a very pleasant light on the enlightened policy of that able body. On p. 57 we show the terribly increasing fire loss of the North American continent as far as ascertained from the records of the insured fire waste.

LONDON BUILDING ACTS (AMENDMENT) BILL, 1905.

The Suggested Provisions for Prevention of and Escape from Fire.

By F. R. I. B. A.

THIS Bill, to be introduced into Parliament during the forthcoming session, proposes to amend the London Building Act, 1894, throughout its various provisions: in this article it is intended only to deal with the proposals in so far as they affect fire prevention and fire protection; but as many of the main provisions of the Bill would, if passed, materially affect the whole system of administration of building law in London, they to that extent come within the scope of this paper.

In 1903 a Bill was introduced by the London County Council to amend the existing law so far as it affects prevention of and protection from fire; that Bill met with considerable opposition, and in consequence of such opposition was withdrawn. A general amendment of the Building Act was taken in hand by the County Council, and the Bill now under consideration is the result.

The principle underlying existing and previous building legislation in London has always been to set out definite rules and provisions in the Act so that any persons commencing to build may know exactly what the law requires of him; it is now proposed to alter this convenient state of the law and to substitute in many instances the inconvenient provision that, in the case of certain buildings specified, no person shall erect any of them without first submitting plans to the County Council, and that the buildings be constructed in accordance with their requirements, a notice of which requirements are to be served on the owner as soon as reasonably practicable after the deposit of the drawings. As the buildings to which this provision would apply constitute a very large proportion of the buildings in London the loss and inconvenience consequent on such a proposal may be easily imagined. No matter how excellent many of the provisions of the Bill may be, this change of principle has already created much opposition and may eventually wreck the proposed enactment.

It will perhaps be most convenient to consider the fire proposals in the order in which they appear in the Bill; and for the sake of brevity it is proposed to adopt the Parliamentary term "clause" when referring to any of the subdivisions of the Bill, reserving the term "section" for those of the Act of 1894.

The first clause to demand attention is clause 60, intended to amend section 54 (dealing with openings and recesses in external walls); the effect of this clause would be t limit the openings in any one storey above the ground floor to one-half the area of the wall in that storey and to three-quarters the length of the wall. Though the present sectio is capable of improvement the new claus would hardly affect that improvement, an would in many cases be found impracticable a somewhat similar suggestion was inserte in the first edition of the Bill (now the Act of 1894, but was abandoned.

Clause 62, a verbal amendment of sectio 59 (dealing with party parapets), is cumbersome; the omission of two words from th section would with greater clearness produc the same effect as the insertion of the word proposed. A new sub-section is inserted t get over the difficulty experienced when tw external walls adjoin and together do dut as a party-wall; it is proposed that unles these external walls have a parapet "1f above the highest part of the roof flat c gutter" they shall be subject to the rules f party-walls; this is somewhat vague, a it is not clear what is meant by the highes part of the roof—is it the ridge, which ma be 20ft. or 30ft. away? Surely it would b better to require the same rules for thes external walls as for party-walls, and so d away with the subterfuge frequently adopte of constructing two contiguous extern walls and so avoiding the wholesome restri tions on the party-wall.

Clause 63 provides for parapets to extern front walls of new buildings "abutti immediately upon the public way. T object of this is not obvious: possibly it intended as a protection for persons on t roof escaping from fire; if so, equally effect means could be provided without the enforc production of such unsightliness. Some su provision occurred in the Act of 1844, a to this possibly the "miles of monoton of many of the London streets is attributab The enactment of such a clause wou encourage the objectionable systems of roofi so common in early nineteenth - centu houses, with a valley gutter in the cen parallel to the party-walls, thus renderi escape from the roof of one building to t next a matter of some difficulty.

Clause 64 as drafted would amend section 62 (1) so that in buildings less than 80ft. in height more than two storeys in the roof might be constructed, provided that one side only were enclosed by roof; this cannot be intended.

Clause 65 would require all stoves and chimney-pieces to be set solid and all cavities to be filled with brickwork or concrete; this is undoubtedly a very reasonable demand in the case of stoves, and a practice generally adopted, though difficult to supervize; but it is unnecessary and impracticable in the case of chimney-pieces set upon the face of the chimney breast. What is wanted is a provision that the arch of the opening in the chimney breast shall not be higher than the opening in the chimney-piece, so that in all cases the chimney-piece shall be fixed on solid brickwork.

Clause 66 supplies various small and mostly verbal amendments of section 64 dealing with chimneys, hearths and flues, generally improvements, though as they would have to be read into the existing sections inconvenient in application. A new provision that flues shall not approach within 2ins. of the centre of a party-wall, therefore prohibit-interlocking and overlying flues in those walls is a much needed improvement: as also is the approval of an iron withe between a smoke flue and an air flue in the same stack, though the thickness demanded (1in.) is excessive, and there is no provision for the proper building-in of such plates. The building into flues of iron or steel joists is also very properly to be prohibited.

While on the subject of chimneys and hearths, it will be as well to draw attention to the absence from the Bill of any provisions for hearth. In the case of stoves of the well type, as the present rules for hearths in section 64 are hardly applicable, this omission should be supplied.

Clause 77 proposes a most retrograde alteration in the law of sub-division of warehouse buildings (as now contained in section 75), which would practically abolish the present limit of 250,000 cub. ft. As the law now stands, that subdivision must be by party-walls *(Holland & Hannen* v. *Wallace*, 55 J.P., 132), and any openings for doorways must be fitted with proper party-wall doors. It is now proposed to accept a subdivision "by party-walls or floors constructed throughout to the satisfaction of the Council," presumably floors of fire-resisting materials (of this more will be said when we come to deal with the schedule). Should the proposed amendment become law it will mean the practical abolition of the party-wall as a means of subdivision of warehouses into fire risks; with a storey of 10ft. in height, the limit would not be reached until a floor space of 25,000ft. had been exceeded (about five-eighths of an acre); very few buildings would cover that space, and, as the wall between the warehouse and the staircases serving the various floors could not be considered as a party-wall, there would be no compulsion to fit the doorways in that wall with party-wall, or even hardwood doors; the existing provisions (themselves hardly sufficient) would be wittled down to the mere construction of very indifferent fire-resisting floors. Instead of relaxing the existing provisions, they should be strengthened; the requirements of the Act of 1894 are somewhat weaker than those of the Act of 1855, as they are confined to warehouse buildings to the exclusion of other buildings used for the purposes of trade. It has very reasonably been suggested that the limit should be 100,000 cub. ft., except when the floors are constructed of fire-resisting materials, when the present limit of 250,000 cub. ft. should apply.

It is also proposed to repeal the conditions (section 76) on which the Council may consent to a building exceeding the 250,000ft. limit, leaving their discretion unfettered.

Clause 78 contains several extra powers to the Council to enable them to consent to the uniting of buildings otherwise prohibited; to these powers, being dispensatory, no objection can be taken, provided than an appeal to the tribunal of appeal be allowed to the applicant. It also provides for the proper provision of bolts and fastenings to party-wall doors, without which such doors are of little practical use. Fire-resisting doors of other material than iron are proposed to be accepted if approved by the Council.

The insertion of a new definition of "uniting buildings," clause 78 (6), should dispose of the peculiar opinion held by some persons that buildings are no longer united when the opening in the party wall is fitted with iron party-wall doors.

There is still a hiatus in the provisions of the Act of 1894 relating to openings in party-walls that the Bill as drafted would not fill. Provisions are required to deal with the making of an opening in a party-wall subsequently to one irregularly made (to meet the case of *Woodthorpe* v. *Spencer*, 63 J.P., 246); for the proper registration of openings in party-walls and periodical supervision to ascertain that regular conditions continue; for the regulation of openings left at the time of erection in the party-walls dividing new buildings, when the possibilities of letting the buildings together or separately are undecided, and the proper closing of such openings when the premises are at any time let separately. Difficulties in these and many other cases occur in practice, and should be removed by a comprehensive set of rules. The efficiency of a party-wall depends upon its integrity, and there are under the existing law many cases where the district surveyor is powerless to secure such integrity.

Clause 80 supplies a defect in the Act of 1894 concerning the width of exit doors in churches and chapels, requiring them to be of the minimum width laid down for corridors, but apparently only up to 4ft. 6ins. wide; this will require further consideration; the maximum width of corridor required under the Act of 1894, viz., 9ft., would be of little use were it to lead to an exit door only 4ft. 6ins. wide. The necessity of clause 81 requiring automatic bolts to the exit doors of all places of public assembly may be questionable.

Clause 82, which makes it quite clear that the rules of the Act apply to the enclosure of railway arches, is a desirable amendment; as also is Clause 83, requiring the subdivision of a shop into several to be executed in fire-resisting material, though, the work being done under the supervision of the district surveyor, the words "to the satisfaction of the Council" are impolitic.

Clause 84 (1) attempts to deal with the much vexed question of the making of openings in the upper part of a wall the lower part of which is undoubtedly a party-wall. Apart from the merits of the proposed clause there are two very important defects that present themselves; as drafted, the rules would undoubtedly apply in a horizontal as well as in a vertical direction, but it would not include the case of an external wall dominating the contiguous external wall of the adjoining building, a case that, equally with the party-wall, demands restriction. The proposal contained in the clause is that no opening shall be made in "the part used as an external wall" within 10ft. of "the part used as a party-wall." This is hardly definite, but presumably it means within 11ft. 3ins. of the lower roof in a domestic building and 13ft. in a warehouse more than 30ft. high; equally possibly it may be interpreted to mean 10ft. in either case. It will be unnecessary here to go into all the law cases bearing on the point (never yet categorically decided in the High Court) whether the upper portion of the party-wall where it encloses one building is or is not a party-wall; suffice it to say that, notwithstanding the obvious intention of the Act of 1894, it has been found in practice all but impossible to restrict openings in that situation. The clause is an effort in the right direction, but does not go far enough; nothing but an absolute prohibition of any opening (except a small ventilating grating) will really meet the necessities of the case. The limit of 10ft. is far too small: this has been demonstrated on many occasions. Another serious difficulty in the application of the clause presents itself: when the window is once constructed what is to prevent the owner of the lower building raising his building, so obliterating the 10ft. margin? Absolutely nothing either in the present law or in the proposed Bill—the clause at once becomes a dead letter. Either all windows must be prohibited or the limit should be at least 25ft., and the lower roof should be of solid fire-resisting construction; also provision must be inserted to prevent the raising of the lower building without the bricking up of the windows.

Clause 84 (2) is not easily intelligible; it seems to aim at preventing any window in one building being within 30ft. of a window of another building opposite thereto and within 15ft. on either side. This appears to abolish all back additions and similar projections, also all streets and light wells less than 30ft. across, unless the difficulty could be got over by the erection of a solid wall in front of each window. This clause would seem moreover directly contradicted by clause 106, which provides for special glazing and shutters to windows within the limit here prohibited.

Clause 87 provides for the protection from fire of constructional ironwork; the provision is desirable, but needs modification. The suggested method of dealing with steel

BALTIMORE FIRE BRIGADE AT WORK ON A WAREHOUSE.

skeleton buildings (clause 89) by entrusting the Council with power to make "regulations" in no way meets the necessities of the case; such regulations would not be subject to the conditions imposed on the making of by-laws by section 164 of the Act of 1894, but could be made by the Council without consulting any professional body. The subject is far too important to be dealt with otherwise than by direct enactment. The Royal Institute of British Architects drafted an excellent set of rules, and these should be given Parliamentary sanction.

The next clause to be considered will be clause 91, which would require all buildings more than 50ft. high to the level of the top floor, all buildings containing a shop that projects more than 5ft. from any external wall of the building, and all buildings (except dwelling-houses for one family) in which twenty persons sleep or are employed to be constructed in accordance with the requirements of the Council as imposed for each building. These requirements are proposed to cover danger from fire and escape from fire. At the time of giving notice to the district surveyor (*i.e.*, two days before commencement) notice is to be given to the Council, with a full set of plans in duplicate, and "as soon as practicable" (weeks or months) afterwards the Council are to issue their requirements, and that although the builder is entitled to commence building at once. It is difficult to conceive that these suggestions will be passed; the buildings affected would include almost every building in London with the exception of private dwelling-houses for one family. Such a provision, if passed, would practically abrogate the provisions of the Act in respect of all these buildings, and substituting the special demands of the Council, which of necessity would vary from time to time. Such proposals could hardly be allowed by Parliament. Uniformity would be impossible, and the loss of time and money and inevitable friction caused by such an arrangement would be incalculable. What is required is a carefully considered definite set of rules dealing with each of these classes of buildings to be administered, as the other rules of construction are, by the district surveyor; the drafting of these is a simple matter upon which valuable suggestions by various professional bodies and committees have already been made.

Clause 97 provides for the application of identical provisions to existing buildings. To this there will be, naturally, even greater opposition. It must, however, be admitted that if necessary rules for protection are to be confined to new buildings, progress will be very slow; some measure of retrospectiveness must be conceded, but the proposal now made would enable the Council compulsorily to require the reconstruction of half the buildings in London with scarcely any limitation of their powers in this direction.

Clause 98 provides for arbitration in case of objection to the Council's requirements. It is not clear whether this is intended to apply to new buildings as well as to existing buildings, but if so, the intention does not appear to be carried out in the drafting.

Clause 101 contains provisions for the separation of buildings, and is intended to be in substitution of section 74, to be repealed.

The first rule, dealing with the separation of buildings from each other, is no improvement on the present Act; it introduces the impolitic words "to the satisfaction of the Council," entailing constant application to that body; all that is wanted is to make it clear that "a proper party structure" is what everyone understands it to mean, a substantial self-supporting floor constructed entirely of fire-resisting materials—if the expression may be allowed, "a horizontal party-wall." This might be done by definition, leaving the existing sections unaltered.

The following rule is intended to take the place of section 74 (3), relating to the separation of tenements within a building. The Act of 1855 provided for the separation by party-walls and party arches or fireproof floors of tenements in a building exceeding 36 squares; the Act of 1894 reduced the limit to 25 squares and omitted the obligation to separate by-walls, leaving only the requirement of the fire-resisting floors, but also demanding fire-resisting staircases. This was done to meet the case of City offices, where it is impossible to say at the time of building how the rooms on each floor will from time to time be let. It is now proposed to revert to the original form, but reducing the size of the buildings affected to 20ft. in height and 8 squares in area, and also requiring fire-resisting staircases enclosed by incombustible materials in building exceeding 25 squares. This will cause a recurrence of all the old difficulties, and the more so as the limit and squares are so severe. It may very reasonably be said that this limit is too low, including, as it will, practically all buildings built for two or more families. It may also fairly be contended that height rather than area should also regulate the application of any rule for separation; a limit of 50,000 cub. ft., thus combining height and area, would probably be found reasonable. What is wanted is one rule for tenement dwellings requiring separation vertically and horizontally, and another rule for offices requiring only the horizontal separation, with fire-resisting staircases in each case.

Clause 101 (4) proposes to limit buildings of the class just dealt with to 50 squares, unless the Council otherwise consent. No objection can be taken to allowing dispensatory powers to the Council, but it is undesirable to make the restriction too severe so as to necessitate that dispensation. A more reasonable clause would be to apply the 250,000 cub. ft. limit as in warehouses, thus allowing larger buildings divided into compartments with party-walls and party-wall doors, but in that case a proper staircase and means of exit should be required for each compartment; this would work automatically and avoid constant applications to the Council.

Clause 101 (5-9) is in substitution for the present section 74 (2), requiring the separation of trade from dwelling premises within the same buildings exceeding 10 squares in area. Upon the existing law it is no improvement, as it perpetuates the defects found to exist. The difficulty disclosed by the case of *Dicksee* v. *Hoskins* (65 J.P., 612) has not been touched upon. It is essential that the clause should categorically require the provision of a structural division between trade and dwelling. Rule 8, though reconstructing the words of the present law as to the openings for communication between the trade and dwelling, falls into a worse error, as though it requires fire-resisting doors between the trade portion and the staircases and passages leading to the dwelling, makes no such provision for direct openings between trade and dwelling when on opposite sides of the same wall, in which case there is obviously a greater necessity for such protection. Rules 6 and 7 require passages and exits to the street of a width dependent on the width of frontage, an obviously inequitable basis to go upon, as the requirements of exit must depend on the size of the building and number of persons rather than the frontage. Provided that a proper exit be afforded there is no necessity for valuable frontage to be taken up to provide it; an exit only 2ft. 6ins. wide, possibly 80ft. long, is encouraged by being specified for 20ft. frontages, a shorter and wider exit to the rear and so to some streets would be more efficient and interfere less with trade. The rule further encourages constant application to the Council by providing for other means of escape to the satisfaction of the Council; matters of such everyday occurrence as buildings of this class should be the subject of clear rules applicable by the district surveyor. Rule 9 seems really to be a duplicate of a clause in the fire-resisting material schedule and should be expunged here.

Clause 102 proposes to deal with rooms over places where inflammable liquid is stored, but in the same impolitic way by special reference to the Council. Surely if these cases can be dealt with by that body as each comes before them, they can put forward some reasonable rules applicable to all cases. If the rules for the separation of trade and dwelling in buildings of 10 squares in area were applied to buildings, whatever their area, for the storage or sale of inflammable liquid (which should be defined) the case would be met.

Clause 103, dealing with boarding and panelling as an internal finishing to walls and ceilings, are altogether insufficient; it is impracticable to avoid some little space behind the boarding, and the danger is due not so much to a small space as to the continuity of the space throughout the building. In buildings of the warehouse class, and in shops and other business premises, boarding and panelling should only be allowed as a lining to a room, the floors, walls and ceilings of which are of or filled in with fire-resisting material, and the space behind such boarding is no more than is required for the necessary fixing battens. In dwelling-houses it would be sufficient if the wall or floor to which the boarding was affixed were fire-resisting. Some consideration should also be given to panelling as distinct from matchboarding. The restriction should be aimed principally at the wholesale use of matchboarding in trade premises.

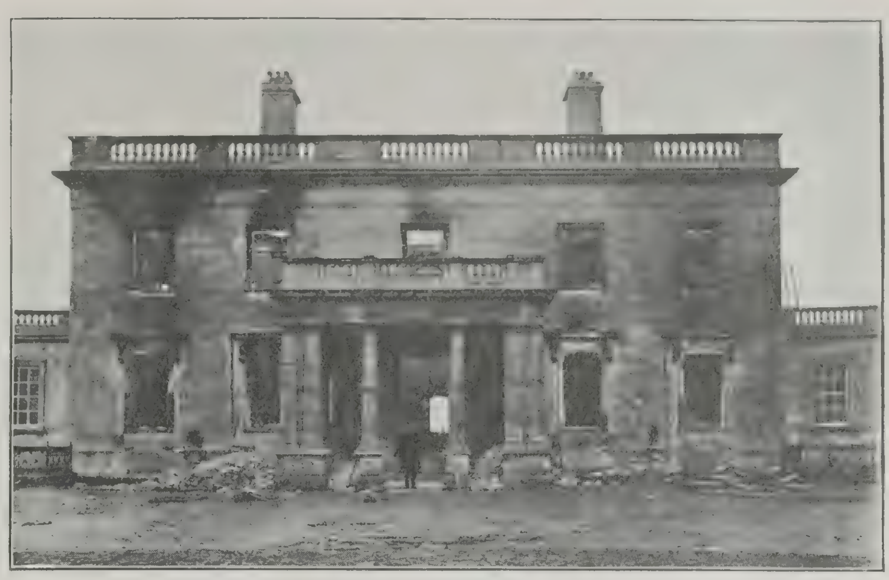
Clause 104 provides some excellent rules for the construction of lift enclosures, which might with advantage even be carried a little further. These provisions are to extend to all existing lifts after seven years—a very desirable provision.

Clause 105 is an attempt to deal with the question of the escape from buildings by the roof, but is hardly happy. It draws no distinction between terrace buildings, where escape to an adjoining building may be possible and useful, and detached and semi-detached buildings, where such escape would not be possible. It is clearly useless to provide an escape to, unless an escape also be provided from, the roof. This clause will require very careful reconsideration, particularly because it is to be retrospective.

Clause 106 proposes that windows within 30ft. of windows in a warehouse building shall be of metal frames glazed with fire-resisting glazing, and that the corresponding windows in the warehouse shall be fitted with iron or armoured doors or shutters. As already pointed out, clause 84 (2) seems to prohibit these windows altogether, without consent of the Council. This clause, as it now reads, appears too drastic.

Clause 159 proposes to confine the exemption of railway companies to buildings and structures exclusively for the companies' use, excluding from the exemption structures "in connection with" the traffic; this is a valuable improvement, the various wooden erections set up as offices and stores for private firms (held by the Courts in the case of *Elliott* v. *L.C.C.*, 63 J.P. 645, to be within the exemption because the goods are carried on the company's lines) are in many cases a standing menace to adjoining property. While, however, curtailing the railways exemption, it is proposed to create a new exemption (clauses 159 and 161) in all the buildings and structures of the County Council and all the other public authorities; this proposal is most unwise for the promoters of the Bill, and practically gives a point to any opposing party. What is more, most of these buildings would be public buildings used as schools, infirmaries, workhouses,

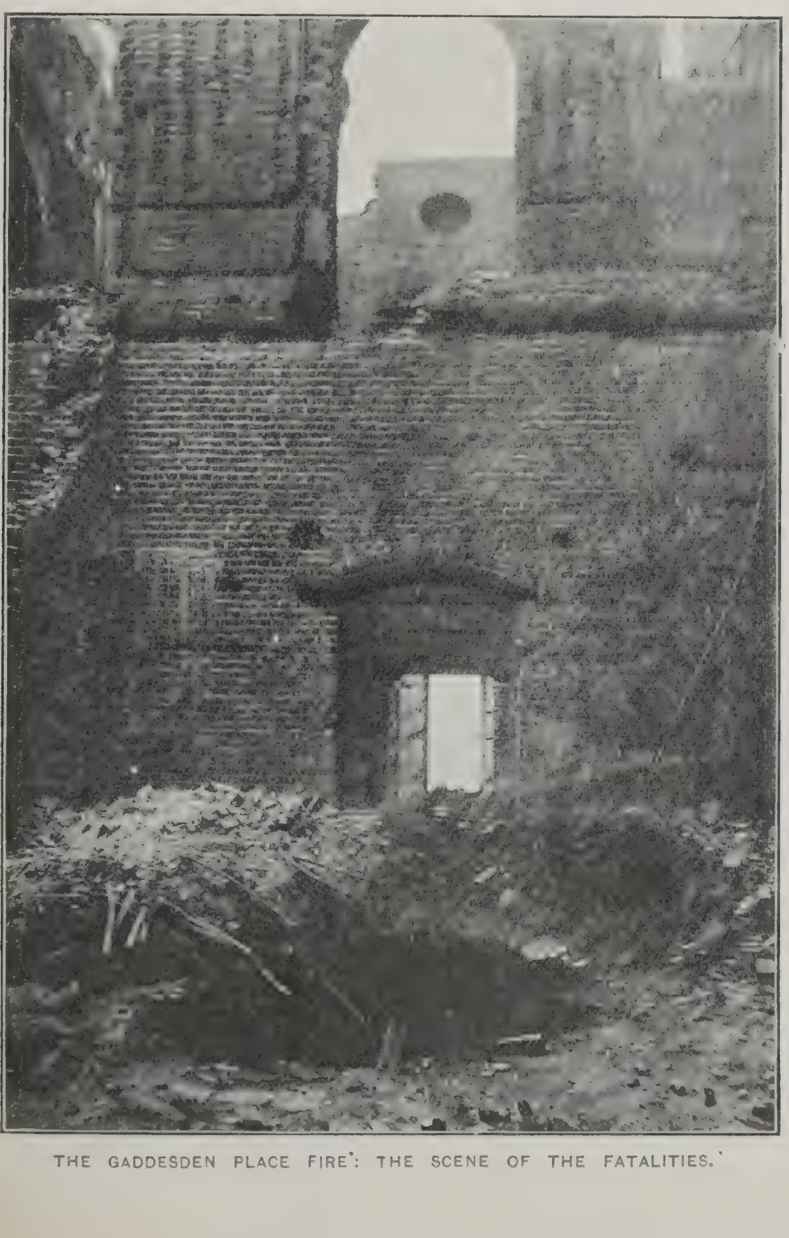
&c., where children, sick, infirm and aged persons would be housed; surely there are no buildings where it is more necessary that proper provision for fire-resisting construction and escape in case of fire should be rigidly observed. All buildings, whether belonging to public authorities or private individuals, should be subject to the same laws.



GADDESDEN PLACE: THE FRONT AFTER THE FIRE.

The first schedule (fire-resisting materials) is an improvement on that in the Act of 1894, to be repealed, though it might in several respects be still further improved. There is, however, one provision in particular to which exception must be taken, as far as new buildings are concerned, *i.e.*, the acceptance as a fire-resisting floor of wood joists with a pugging of concrete 5ins. thick carried on wood fillets fixed centrally in the depth of the concrete. Though there are many objections to the use of wood, particularly deal, in floors supposed to be fire-resisting (notably the dense smoke given off, and the chances of rot and shrinkage), for its retention in existing floors to be made fire-resisting, something may be said on account of the impracticability in many instances of removing the whole floor to substitute one of steel and concrete; but in the new building such reasons do not exist, and a really fire-resisting floor should be required. Moreover, the schedule as drafted would allow of the construction of a floor that would fail in a very short time; it would allow the pugging to be flush with the top of the joist, leaving, in the case of an 11in. joist, the lower 6ins. exposed to the fire without even the protection of lath and plaster. A wood and concrete floor should only be allowed in an existing building, and then only if the concrete be level with the soffit of the joists and without rough boarding of any description, the whole being protected on the underside with metal lathing and plaster. Though the smoke danger is still present, a floor thus constructed will resist a fierce fire for two hours.

There can be no doubt that the present law requires amending and strengthening; but the present Bill certainly requires some modifications in order to give London an up-to-date and workable enactment. Further, if some of the provisions on the administrative side regarding the proposed additional control by the County Council are not waived at an early opportunity, it may be safely assumed that the opposition to the Bill will be so strong that nothing will come of it, which would be highly regrettable from the fire point of view. With a little "give-and-take," and a little tact in the latter direction, the promoters' wishes may, however, be met to a very considerable extent to their credit and to the benefit of the metropolis.



THE GADDESDEN PLACE FIRE: THE SCENE OF THE FATALITIES.

COUNTRY HOUSE FIRES.

THE country has been suffering from quite an epidemic of country-house fires during the past eighteen months. The fact that the buildings destroyed included several of high architectural and archæological value has at last also aroused public attention to this scandal, which is mainly due to the carelessness and indifference of the owners, whose very last thought is generally in the direction of fire protection, and who neither by personal interest nor expenditure—with some few rare exceptions—protect their families, their servants and their property from the consequences of a possible outbreak of fire.

We shall take an early opportunity to deal with the subject at some length, but would in the meantime warn householders against the ignorant, unreliable, so-called "inspectors" who seem to think that some little fire-brigade experience is all that is required to advise owners as to the necessary precautions they should take, and house agents who now venture to advise. It is better to take no advice at all, and be guided by common-sense alone, than to be stupidly lulled into a sense of security by incompetent and unreliable advisers.

We are particularly giving these words of caution in this supplement, as we have various circulars dealing with the matter before us, and in every case these circulars, on the face of them, show the charlatanism of the proposals made.

As illustrative of country-house fires we show two photographs of the one at Gaddesden Place. There the fire was followed by the sad deaths, recorded in the daily press, of the butler and footman whilst attending to the wine-cellar. The second photograph shows the actual scene of the fatalities, besides giving an idea of how completely the building was gutted.

THE SMALLER TESTING CHAMBERS OF THE FIRE PREVENTION COMMITTEE.

LONDON FIRE TESTS.

(By Our Special Commissioner.)

It is not often the fortune of a non-member to be able to attend the testing operations of the British Fire Prevention Committee, unless he happens to be a government, municipal or insurance official. The attendance at such tests is very strictly limited, the members only attending by rotation, and strangers—if they are not official representatives—being only quite exceptionally seen within the testing station grounds. Though perhaps not quite realized, there is always a considerable risk of accident at tests. The volume of flame is considerable and extremely gaseous, and the hazard of a falling wall or a gas explosion is considerable. This is evidenced by the fact that when issuing invitations the Committee does not hold itself responsible for injuries sustained by a visitor. No description, account or criticism of a test other than the duly authorized official report is allowed.

It was my privilege to attend the testing operations one afternoon this winter, with special permission to write about what I saw, provided that particular reference to the actual tests undertaken was avoided.

On arriving at the testing station situated in Porchester Road, Bayswater, some little time before the appointed hour, everything was in readiness for the day's programme. The site is secluded, having quite a narrow frontage to Porchester Road, and one of its boundaries abuts the Great Western Railway. Where there is a possibility of overlooking the site, the portions are screened by the erection of trellis-work about 30ft. high. The testing plant comprises three testing chambers, two back to back, measuring 10ft. by 10ft. in floor area, and one measuring 22ft. by 10ft. in floor area, the measurements being taken inside the walls. The necessary fire is produced by a large gas-producing plant (installed by Messrs. Mason, of Manchester), from which an 18in. pipe runs to the testing chambers, and from which gas is taken into these chambers by the aid of subsidiary pipes controlled by valves. The flame from these gas fires is of great intensity, occasionally streaming like a gigantic burner, but it also spreads from time to time, consuming its own smoke, and creating that volume of fire which is such a dangerous factor in actual conflagrations. The temperature of the fire is measured to a nicety with the aid of Robert-Austens pyrometers, pyrometer points being distributed in each testing chamber and the electric current carried by overhead wires to the instrument room.

No fire test would be complete without the very serious water test, for it is often the case that materials will stand quite a considerable amount of fire but at the veriest touch of water will disintegrate or collapse. This water test is obtained with the aid of a very neat small steam fire-engine.

The actual work of taking a record of what has happened during a test is generally entrusted to a special testing sub-committee, which is formed from among members of the Executive and members of the Committee. As a rule, at least one district surveyor is on the sub-committee, and then, according to the subject, either an architect or an engineer, and perhaps a fire-brigade officer or an insurance surveyor.

The gentlemen acting on this Testing Committee have various duties allocated to them, and the tests are conducted with remarkable smoothness; and as the temperature can be made to rise and fall by due working of the valves, &c., practically all the tests may be said to be on uniform lines as far as conditions are concerned. Say a testing operation is intended to involve a temperature of not less than 1,800 degs. at the finish, the temperature to rise gradually to that point, it will be seen time after time how, just at the close of the test, the temperature, which has been gradually rising, is brought to 1,820 degs. or, say, 1,850 degs. Fahr.

I noticed at the Test a very important Government official whose work brings him frequently in close touch with the question of fire and fire-prevention, the chairman of the Executive, a leading waterworks engineer, and about a dozen insurance surveyors and half a dozen district surveyors; also several architects well known as men of practical and constructive experience. Amongst the visitors were some of the leading members of the professional and volunteer fire service.

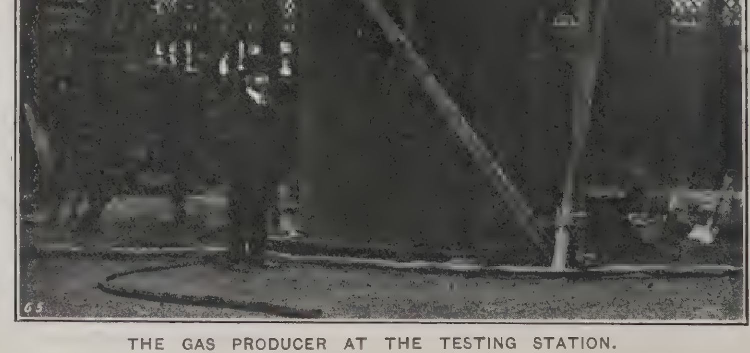
Obviously, occasional meetings on a common subject between men belonging to different though kindred professions must in itself mean a considerable interchange of knowledge and experience. In these instances the primary object is the unravelling of the truth relating to fire-resisting materials, and there is certainly no better subject for debate if one remembers the different aspects in which such materials have to be regarded.

The first test on the occasion here dealt with was a short one, the object being to attain classification as affording "temporary protection" only; the next test was a more ambitious one, when an attempt was being made by the owners to attain classification as affording "full protection"—a classification but very rarely obtained.

The firm whose goods were intended to afford temporary protection passed through their ordeal with flying colours. It was generally anticipated that they would withstand the ordeal of fire, for they had already been through several minor tests; but that they should have also brilliantly withstood a very severe ordeal of water—in this case applied directly at right angles and at about 45 lbs. pressure from a steam fire engine—came, I understand, as a surprise. This firm had submitted to no fewer than three tests on previous occasions, doing a little better each time.

It is to firms of this description that the tests must be of great importance. Although, perhaps, not quite successful at the outset, they learn what can be obtained by some small improvement, and gradually as the improvement is perfected the desired results are obtained.

The second test dealt with one for the "fully protective" class. It was a product presented by an old established firm of high technical standing. The material beat all



THE GAS PRODUCER AT THE TESTING STATION.

THE FINAL WATER TEST AFTER THE FIRE TEST.

records, as far as fire alone was concerned, and passed the ordeal necessary to get into the Committee's topmost classification, but during the second minute of the two minutes' water ordeal—through which the work has to pass—there was a collapse, and by about 45 seconds the makers missed their goal. Here again, however, the miss was entirely dependent upon the absence of some small improvements, with the aid of which the highest classification would have been obtained.

The third test was what are called the Committee's private tests, *i.e.*, they were a series of tests with sprinklers for the information of the members. Sprinklers of various types and kinds were being examined with a view to ascertaining what they would do in certain practical circumstances, and it was remarkable to see the variations and unexpected results.

The most striking lesson of the testing operations of the afternoon was the realization that a safeguard in matters of fire-resisting construction is only as strong as its weakest point, and that where there is a weak point it must be so strengthened as to meet actual requirements.

I have mentioned the danger attendant on these investigations, but as these tests are veritable clothes' wreckers of the first order, many a boot, coat and hat being irredeemably spoilt on such occasions, it cannot be an inexpensive matter for the workers and the members attending and helping in the test, none of whom receive any remuneration but have to bear all their own out-of pocket expenses as well.

Speaking generally, the whole of the work was pleasurable, and it is extremely carefully done, of an absolutely independent character and of enormous value both to tesfor and testee; for there is no doubt that whilst a successful test means business of considerable magnitude for the owners, the amount of instruction afforded at a test is also of considerable value to those attending the investigation.

I understand that testing stations of a similar kind have been already started in other countries. Some stations have become mere official institutions, others are particularly private ventures of insurance corporations, but the combination of the leading technical professions, architects, surveyors, and insurance surveyors taking up a matter jointly and handling it as it is done in the Metropolis, seems to me to ensure its independent character and to be of the greatest value.

London has been saved from the introduction of many a material and appliance, generally of foreign origin, which unscrupulous vendors have tried to foist upon a public without first ascertaining its merits through the work done at these testing stations.

A successful test should be the hall mark for a manufacturer. It can only be a matter of some few years before testing operations will be compulsory either by legal enactment or local by-laws, and the sooner this day comes the better. All praise, however, to the body of public-spirited men who at their own expense of both money and time are meanwhile guarding London against the dangers of fictitious so-called "fireproof" commodities being used in building construction.

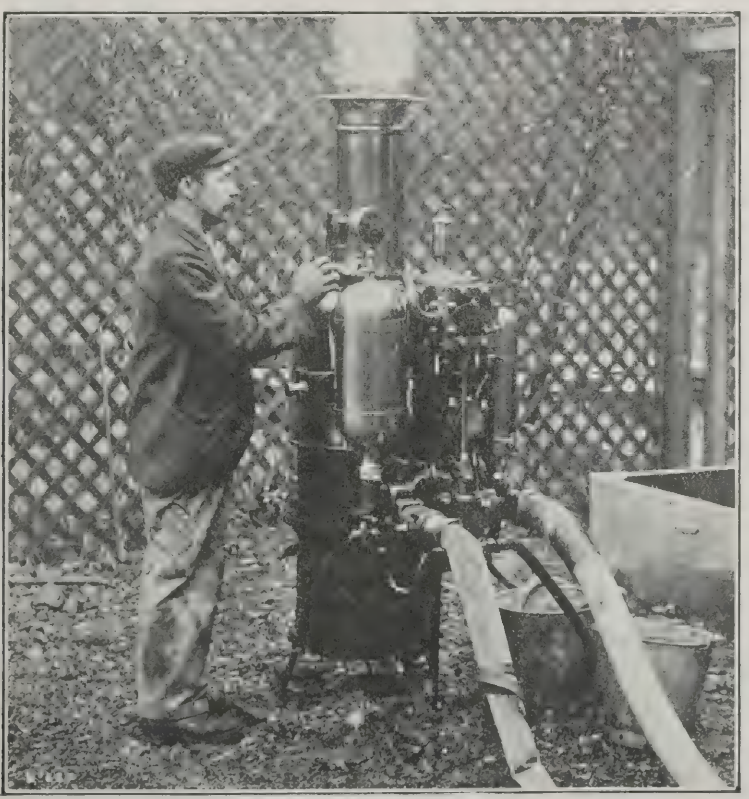
LOSS BY FIRE IN THE UNITED STATES AND CANADA.

THE following interesting particulars, taken from the "Times" commercial supplement, show the enormous fire waste on the North American Continent during 1904, and the general increase of waste during the last thirty years:—

The fire losses for the United States and Canada during the calendar year 1904 were greater than in any year since 1871, when the great destruction at Chicago made a record which can hardly be reached again. The waste from this source during the twelve months amounted to 252,364,050 dols. Included in this were three great fires—namely, those in Baltimore, Maryland, which caused a loss of 70,000,000 dols; in Rochester, New York, with a loss of 3,200,000 dols.; and in Toronto, with a loss of 12,500,000 dols. If one excludes these, the total of the small and moderate fires would still make a loss of 166,664,050 dols., of itself a large increase over the aggregate of 1903, and nearly 30,000,000 dols. beyond the average of the previous ten years. The following statement gives an idea, in a comprehensive form, of the destruction by fire on the North American Continent north of the Rio Grande river during the past thirty years:—

	Dols.
1904	252,364,050
1903	158,195,700
1902	149,260,850
1901	164,347,450
1900	163,362,250
1899	136,773,200
1898	119,650,500
1897	110,319,650
1896	115,655,500
1895	129,825,700
1894	128,246,400
1893	156,445,875
1892	151,516,600
1891	143,764,000
1890	108,993,700
1889	123,046,800
1888	110,885,600
1887	120,283,600
1886	104,924,700
1885	102,818,700
1884	110,008,600
1883	110,149,000
1882	84,505,000
1881	81,280,000
1880	74,643,400
1879	77,703,700
1878	64,315,900
1877	68,265,800
1876	64,630,600
1875	78,102,200

[Note: 5 dols. = £1.]



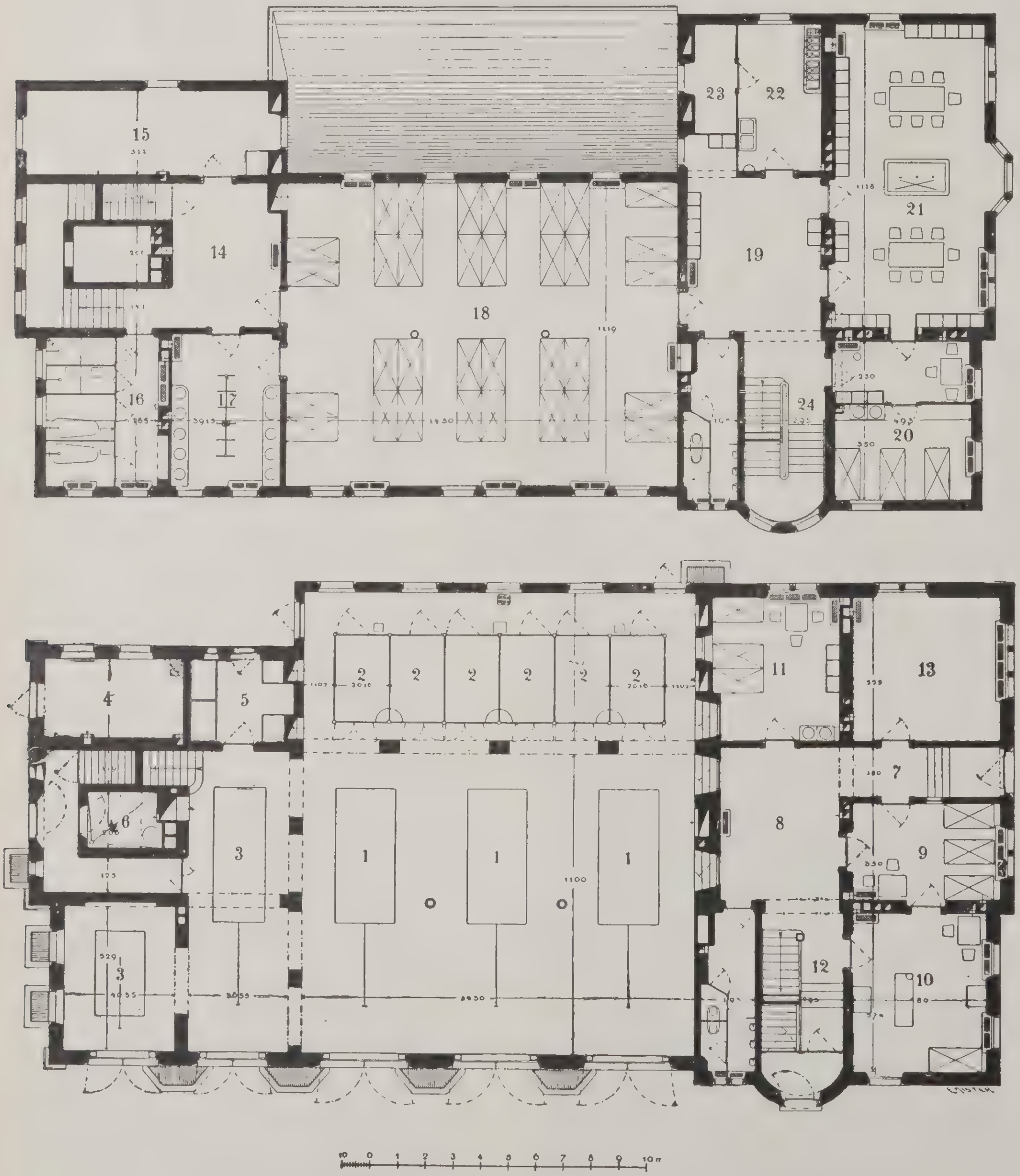
A PORTABLE STEAM FIRE ENGINE AT THE TESTING STATION.

NUREMBERG FIRE STATION.

THE new district fire station at Nuremberg, here illustrated, stands in its own grounds adjoining a small public park, and in close proximity are some municipal carpenters' workshops and smithies in which the majority of the men engaged at this fire-station are employed, for there is what is generally termed a retained brigade of municipal employees, the men following their ordinary trades for the municipality and turning out regularly to drills and fires. The building was completed about two years ago. It comprises a rather extensive block having a spacious and high ground floor, a very commodious first floor, and an exceedingly well arranged attic floor (utilized for stores) with a very cleverly arranged gymnasium in the roof. There is the usual hose tower, which can also be used for drill purposes. The architectural style of the building is that generally associated with modern Nurnberg, and is not displeasing to its surroundings. The engine-house proper on the ground floor has accommodation for three fire appliances, which comprise a chemical engine, an 80ft. long ladder and a hose trap, close behind which are the stables for the necessary six horses. Adjoining the engine-house is a reserve coach-house with a heavy steamer and a hose cart. On the ground floor also are a spare loose box, fodder store, room for coachman, and a watch room and a duty room. On the first floor there is a very large dormitory in which are quartered the men forming the crew of the fire station. It will be seen from the plan that there are beds for twenty-one men in this dormitory. In addition, a well-equipped day room with a billiard table, and a foremen's room, lavatories, bathrooms, &c., are provided on this floor. The details of the arrangements are explained by the references printed above the illustrations.

A Correction.—In the preceding Fire Supplement we indicated that apparently the fire-resisting curtain at the Crouch End Opera House was not of asbestos cloth. We have now examined some specimens of the cloth in question and find, however, that it is asbestos cloth, so that our original supposition was not correct.

1. Engine-house.
2. Stables.
3. Reserve appliances.
4. Loose box.
5. Fodder.
6. Hose tower.
7. Entrance.
8. Lobby.
9. Duty man.
10. Watch-room.
11. Coachmen.
12. Main stairs.
13. Office.
14. Lobby.
15. Spare kit store.
16. Baths.
17. Lavatory.
18. Dormitory.
19. Lobby.
20. Foremen's room.
21. Day-room.
22. Pantry.
23. Larder.
24. Main st airs.



THE NUREMBERG DISTRICT FIRE STATION: FIRST-FLOOR AND SECOND-FLOOR PLANS.

FIRE PROTECTION IN CENTRAL EUROPE.

ON p. 14 of the Fire Supplement included in our issue for November 23rd, 1904, we referred to the visit of the British delegates to the Budapesth Fire Congress and to various cities in Central Europe, and indicated that an official report was about to be issued by the British Fire Prevention Committee dealing with the journey of this special commission. The cities visited were Vienna, Budapesth, Munich, Nuremberg, Frankfort and Cologne.

We can recollect no occasion in which any special commission of this kind has dealt so exhaustively with questions of fire protection as practised abroad. In 1894 some notes were issued as to a journey not dissimilar to this one by a party of fire-service officers visiting Berlin and Vienna, and last year a souvenir of the visit of another party of fire-service officers to France was published; but nothing comparable with the record now before us has ever been published before in this country, nor can we find anything of the kind among foreign publications. The record is thus unique, as giving expression to the views of and technical notes by a commission thoroughly representative of our fire-preventive and national volunteer fire service, for the commission itself comprised not only the chairman and the two honorary secretaries of the Committee, but of three other delegates from the Committee and three further delegates from the National Fire Brigades' Union. Nearly all the commissioners occupy leading positions in their various specialist work, so that it is not only representative opinion, but exceedingly authoritative opinion, that is embodied in the record in question.

The record occupies about sixty pages quarto size, interspersed with about forty excellent illustrations. It comprises an introduction with a summary of the impressions obtained, followed by a diary of the journey, with copious annotations. The arrangement of this diary is particularly convenient for reference purposes. There is also an index of subject-matter. The record also has two appendices, one dealing with the general arrangements of the commission as to travel and programme, and the second relating to the Antwerp petroleum fire, which we have dealt with in a previous Supplement.

From the appendix dealing with the general arrangements one sees that the members of the commission each paid their own expenses, which figured at about £35 per head; that they travelled outwards and homewards over 2,000 miles, spent ten days in what we may describe as the work of the commission, four days in travelling and three days in well-deserved relaxation.

A very great portion of the report deals essentially with fire-service matters, but this, we think, will be somewhat outside the scope of our present article, and thus we only refer to this side of the question by giving the commission's general summary, which includes mention of fire-brigade work. This summary reads as follows:—

"From among the various impressions recorded above, the

THE NUREMBERG DISTRICT FIRE STATION.

following points might be said to be those which most impressed them selves on the mind of the members of the Commission as being particularly commendable :—

(*a*) The great attention paid to questions of technical detail in building legislation and control.

(*b*) The co-operation of the building control departments and fire brigades in the fire-survey systems.

(*c*) The general exits, stage drenchers, the substantial fire-resisting curtains, the numerous fire-call points, and the efficient fire-watchers in theatres.

(*d*) The high general state of efficiency in the country fire brigades, and usefulness of the national fire-brigade associations.

(*e*) The general high efficiency and splendid equipment of the professional fire brigades.

(*f*) The excellence of the mechanical long ladders.

(*g*) The great attention paid to auxiliaries by the professional fire service.

(*h*) The economic organization of a retained brigade of municipal employees under professional officers.

(*i*) The provision of ample water-supply under high-pressure, and the general introduction of standard hydrant posts.

(*k*) The high efficiency of the volunteer ambulance societies, and the excellence of their organization and equipment."

After the above summary we will now give, seriatim, the commission's impressions of fire prevention, theatre safety, and fire-survey matters in the cities visited.

Fire Prevention.

1. Architects, engineers and public officials were found generally to take more interest in questions of fire prevention than is the rule at home. They seem impressed with the necessity of systematic fire prevention for the public wealth.

2. The codes of general building regulations and special fire-prevention regulations were everywhere found to be of a very comprehensive character. In Bavaria and in the Rhenish cities visited the control of minute details appeared remarkable.

3. No limit seems to be placed upon the area and cubical extent of individual buildings, but buildings of more than ordinary size are subject to such precautionary measures in matters of detail as the separation of shop windows from the counters and gangways by fire-resisting materials, to prevent an outbreak of fire immediately involving disaster. Another such point of detail was the exact definition of the maximum distance from any point on a floor to the nearest staircase. Another was the suitable provision of electric fire-call points in large retail stores, and the provision of fixed iron scaling ladders to facilitate the rapid entrance of firemen to the upper storeys of this class of building. Again it was observed that in one of the retail stores all the iron doors in a divisional wall could be operated electrically from one point and closed simultaneously.

Theatres.

1. The whole problem of theatre safety seemed an essentially different one to that to which we are used in Great Britain, for, owing to the theatre being looked upon as the shrine of art that must have an isolated site, the question of planning with the view of obtaining rapid exit is simplified.

2. Further, owing to its being considered essential to have large ante-rooms and lounges to congregate in during the intervals of a performance, the whole difficulty of obtaining corridors and ante-rooms of sufficient width around the auditorium in the interests of safety are obviated. Speaking generally, exits and exit staircases were found to be excellent in all the theatres visited.

3. On the stage the precautions of reducing the amount of inflammable material by substituting metallic construction for wood construction was generally observed. But the rendering of scenery non-inflammable was only practised in one or two instances, and then only in a very perfunctory manner, without due regard to the necessity of impregnating the thin scantlings of the scenic framework.

4. Great reliance appears to be placed in stage sprinklers or drenchers, and no theatre was visited that had not a complete system of stage drenchers. There is no doubt that, if brought into action, these drenchers are highly efficient, but it is essential that they should be controllable from two points at least—one on the stage and one at a distance from the stage. The impression obtained from the actual working of the drenchers at Budapesth was thoroughly convincing as to their efficiency if promptly operated.

5. Everywhere the substantial fire-resisting

curtain of metal framing and metal surface was found, the latter frequently supplemented by a protective covering or a filling of a non-conductive character. The division of the auditorium from the stage by strong fire-resisting curtains was supplemented by similar divisions between the main stage and the so-called rear stage which generally served as an extensive scene dock.

6. Precautions were taken for limiting the use of open lights by applying electrical heaters in the dressing-rooms for making up, &c.; and considerable attention appeared to be given to such matters of detail.

7. The general neatness of the stage and the cleanliness of the stage offices, as also the general military precision of the working of the stage staff, called for remark.

8. A large number of electric fire-call points (frequently also automatic thermostat fire-alarms) were provided.

9. Strong theatre-fire watches were also provided by the brigades. In some cities there were permanent watches apart from the watches provided during the performance

Fire-Survey Work.

1. The senior local fire-brigade officers, both professional and volunteer, were everywhere consulted by the local authorities on all matters of fire prevention in buildings, passing of plans and the like.

2. At Munich the fire-brigade and building-control work was in the hands of one department and under one chief official, it being rightly considered that the correct economic management of the fire question was to have both the fire preventive and fire-brigade service in one hand, the fire-brigade service being supplementary to the fire-preventive service. This was, however, the exception, although there was some slight similarity in Vienna, where the municipal brigade practically ranks as portion of the surveyor's department.

3. Generally speaking, fire-brigade officers were very considerably utilized for fire survey in conjunction with the building-control departments, and are frequently called upon to make inspections, &c.

It would lead too far to go into detail regarding individual items from the technical notes, but we think it would be of general interest to indicate the style in which they are presented and at the same time give instances of other interesting information. Thus, on p. 33 of the Report we notice the following particulars in an annotation of the commission's visit to

The Hofburg Theatre at Vienna,

a splendid structure erected from the plans of the late Gottfried Semper and Baron Hasenauer:—

"This theatre was far and away the finest piece of theatre architecture seen *en route*. In plan, arrangement, design, decoration and equipment it is unrivalled. The exits seemed ample. It is, however, subject to a considerable risk of fire through antiquated electrical installation. The switch-room on the stage is one of the most dangerous the members of the party have seen. Besides being dangerous electrically, it is highly inflammable and lined with matchboarding. There was much unnecessary matchboarding and woodwork in the theatre. It appeared curious that such a building, on which such an immense sum of money had been spent, should contain defects so palpable that they are inexcusable. The staircase from the stage to the mezzanine was very antiquated and capable of much improvement. The stage was about 23 metres deep, namely, from the curtain to the back wall. There was an opening in the back wall on to a back stage, used to make the stage deeper for certain effects. Both this opening and the proscenium opening were fitted with iron curtains constructed of a framework covered with corrugated iron sheets. The stage was fitted below the gridiron floor with a system of pipes perforated at intervals, forming a sort of dry pipe sprinkler or "drencher" arrangement, it being possible to turn the water into the pipes at the stage-level but not, as far as could be learnt, from any other part of the house. The theatre has its own fire brigade. There were four tiers of "flies," but no water-pipes could be seen under these nor under the stage."

The Budapesth Opera House.

Again, dealing with another instance of the question of theatre safety, we find the following annotation in connection with the commission's inspection of the stage sprinklers at the Royal Opera House, Budapesth:—

"Perforated pipes, serving as dry pipe sprinklers, are fitted under the gridiron of the stage; the tanks for supplying same have a capacity of 90 cubic metres. If the whole of the sprinklers are turned on simultaneously the water in the tanks would last eighteen minutes. There are twenty-four hydrants in this building, always under a pressure from 2 to 2·75 atmospheres; this is indicated by water gauges. In case of emergency a higher pressure can be obtained off these hydrants by aid of two gas-motor driven pumps, which can increase the pressure up to about 7 atmospheres on ground and first floors and 5 atmospheres on the third tier. A remarkable display was given, the sprinklers being used with very good effect. Four deliveries were also brought into action from the stage; also three deliveries from the first fly galleries; also two from the second fly galleries, one hydrant being opened to serve each delivery. The pressure of water from all branches was exceedingly good. The stage was literally flooded out, so that no fire could have lived in this deluge."

The Cologne City Theatre.

To give a third instance on the point of theatres, we present the Committee's annotations on p. 61 when referring to the new Cologne Opera House, better known as the Municipal Theatre.

"This theatre, designed by Herr Moritz, who at the same time acted as contractor, has seating accommodation for 1,805, and is used as an opera house. It is exceptionally well planned and embraces all modern improvements. In conjunction with the theatre there is a large restaurant and concert garden, but this is practically detached. At the rear of the theatre there is a well-equipped scene store of considerable dimensions. The theatre is particularly well-equipped with telephones, call points and the like. The fire-call points are distributed one on either side of the stage and one on either side of the auditorium. In the respective corridors and on each level there are additional call-points besides, making sixty in all. The call-points are also utilized as electrical watchmen's control points. The stage is protected by a sprinkler system so arranged that it can be started in sections or as a whole. There is a reserve of water of 50 cubic metres in tanks at the top of the building. The fire-resisting curtain was operated from two points. The general impression from the fire point of view was that the exits were of more than ordinary excellence."

We would gladly go further in our annotations, taking up the references made in the report about retail stores, warehouses, &c., and last, but not least, the notes referring to some of the excellent fire stations which were visited.

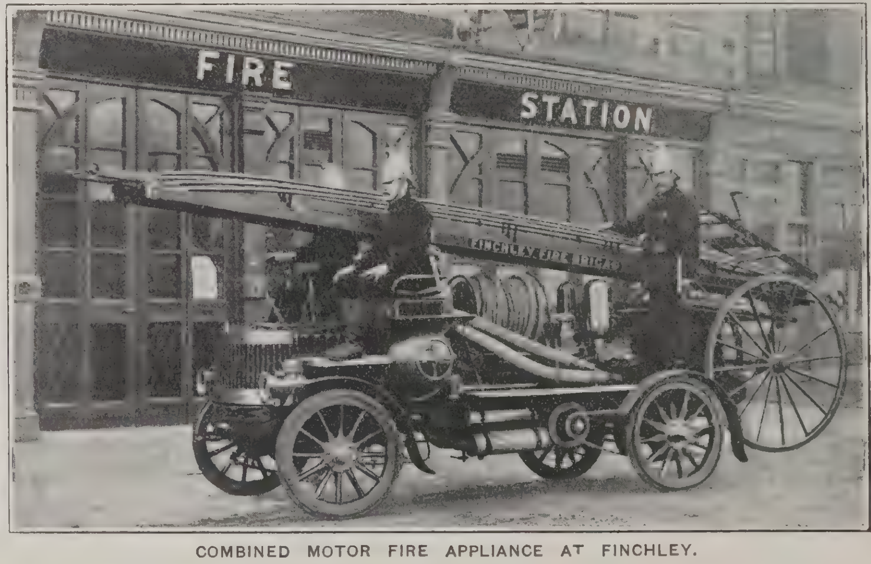
To indicate the character of the illustrations we present a photograph and two plans of the Nuremberg fire station, situated in that beautiful historical centre of South German arts and crafts. We think that both in plan and elevation the station in question well merits reproduction in these columns, and that Nuremberg is to be congratulated in having so excellent a building.

In conclusion we would express the hope that some of the impressions gained and the lessons learnt by the commissioners will find practical application in the British Isles, and that the report may have the attention of those who are in authority. We are glad to see that a certain number of the reports are to be put at the disposal of various official departments, and that also a considerable number will, *ipso facto*, go to chief officers of fire brigades.

"The Record of the Special Commission formed by the British Fire Prevention Committee to visit the cities of Central Europe, &c.," issued by the British Fire Prevention Committee, 1, Waterloo Place, London, S.W., price 5s.

COMBINED MOTOR FIRE APPLIANCE.

WE illustrate herewith an exceedingly useful appliance which has been provided for the Finchley Fire Brigade; the manufacturers are Messrs. Merryweather, Ltd. This appliance is practically a combined chemical engine, fire engine and fire escape, and is a self-propelled appliance. It is manned by a fireman or engineer and three firemen. It has a hose reel, broad side on, ready for instant use, and as a first-aid appliance it should be very practical. Although we are not, generally speaking, in favour of combining so many appliances on the same carriage, and would have preferred to have seen a larger tank of water carried, the appliance is, however, an enormous advance upon what we have been accustomed to prior to the International Fire Exhibition at Earl's Court, when chemical engines and combined appliances came before the public in a comprehensive way, and the Finchley Council and the makers are to be congratulated on the provision of an up-to-date equipment of an engine of this character.



COMBINED MOTOR FIRE APPLIANCE AT FINCHLEY.

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Feb. 16	Abergavenny—Repairs to Cottages	—	Gas Manager, Gas Works, Abergavenny.
,, 16	Beaminster—School	Governors	R. Leigh, Beaminster.
,, 16	Liversedge, Yorks—Bungalow	—	J. Kirk & Sons, Architects, Huddersfield.
,, 16	Manchester—Reconstructing Bridge	Improvement and Buildings Committee.	City Surveyor's Office, Town Hall, Manchester.
,, 16	Wheatley Hill, Durham—Club Premises	Workmen's Club	H. T. Gradon, 22 Market Place, Durham.
,, 17	Borstal, near Rochester—Additions to Church	—	W. T. Margetts, Bankside, Borstal Road, Rochester.
,, 17	Carlisle—Rebuilding of Theatre	—	Bendle & Hope, 33 Grainger Street W., Newcastle.
,, 17	Merthyr, Wales—Alteration to Elevation of Inn	—	C. M. Davies, 112 High Street, Merthyr.
,, 17	Rotherham—Stabling, &c.	Corporation	J. Platts, High Street, Rotherham.
,, 17	Atcham—Additional Storey to Bathroom	Guardians	Union Offices, St. John's Hill, Shrewsbury.
,, 17	Oulton, near Lowestoft—Enlargement of Buildings	County Education Committee	F. W. Richards, 14 Stanley Street, Lowestoft.
,, 17	Sheffield—Widening Bridge	Improvement Committee	C. F. Wike, Town Hall, Sheffield.
,, 17	Willesden—Enlargement of Sorting Office	Commissioners	J. Wager, H.M. Office of Works, Storey's Gate, S.W.
,, 18	Polseath—House	—	G. T. Trevail, Court Place, Wadebridge.
,, 18	Harrow-on-the-Hill—Isolation Ward at Hospital	Urban District Council	J. Percy Bennetts, Surveyor, Harrow-on-the-Hill.
,, 18	Harrington, Cumberland—Two Houses	—	W. G. Scott & Co., Victoria Buildings, Workington.
,, 18	S. Shields—Municipal Buildings	Town Council	J. M. Hayton, Town Clerk, S. Shields.
,, 18	Eccles, Lancs—Fitting Vestry Hall	Corporation	Town Clerk's Office, Eccles.
,, 18	Doagh, co. Antrim—Alterations to Mill	—	J. Russell, 22 Waring Street, Belfast.
,, 18	Bramley—Carshed, &c.	—	J. B. Hamilton, City Square, Leeds.
,, 20	Cleator Moor, Cumberland—Library	Urban District Council	R. Robertson, Public Offices, Cleator Moor.
,, 20	Long Eaton—Library	Committee of Long Eaton Free Library.	Gorman & Ross, York Chambers, Long Eaton.
,, 20	Risca, Mon.—Twenty Houses	Urban District Council	A. J. Dardis, Council Office, Risca.
,, 20	Thurlstone, Devon—School	—	Rectory, Thurlstone, Kingsbridge, S. Devon.
,, 20	Hoo, Kent—Enlargement, &c., of Schools	Education Committee	G. E. Bond, Pier Chambers, Chatham.
,, 20	Nottingham—Engine- and Boiler-house	Water Committee	W. B. Starr, 12 St. Peter's Gate, Nottingham.
,, 21	Farnborough—Four Cottages	—	W. Bartlett, Jessie Cottage, Rectory Road, Farnborough
,, 21	Petersfield—Enlargement of Laundry Buildings	Petersfield and District Laundry Co.	G. C. Vernon, Inkpen, 40 Commercial Road, Portsmouth.
,, 21	Steyning—Infirmary	Guardians	E. Cripps, Union Offices, New Shoreham.
,, 21	Aylsham—Tramps' Cells	Guardians	H. J. Gidney, Clerk, Aylsham.
,, 22	Leigh, Lancs—Bridge	—	T. Hunter, Borough Engineer, Leigh.
,, 22	Dartford—Buildings to Hospital	Metropolitan Asylums Board	Office of Board, Embankment.
,, 23	Belgrave, Leicester—House, &c.	Sewage Works and Farms Committee.	E. G. Mawbey, Town Hall, Leicester.
,, 24	Whittington—School	Education Committee	H. E. Wale, 11 College Hill, Shrewsbury.
,, 24	Penydarren, Merthyr Tydfil—Congregational Church	—	Horeb Chapel Schoolroom.
,, 24	Shepherd's Bush—Sorting Office	Commissioners	J. Wager, H.M. Office of Works, Storey's Gate, S.W.
,, 27	Raglan, Mon.—Alterations, &c., to School	—	W. H. D. Caple, Church Street Chambers, Cardiff.
,, 28	Batley—Post-office	Commissioners	Secretary, H.M. Office of Works, Storey's Gate, S.W.
,, 28	Preston—School	Corporation	Director of Education, Education Offices, Preston.
,, 28	Gateshead—Wesleyan Church	—	W. S. Ellison, 2 Sir Thomas Street, Liverpool.
arch 1	Carmarthen—Schoolroom, &c., to Chapel	—	Rev. S. Thomas, Parkglas, Cemetery Road, Carmarthen.
,, 3	Connor Downs—Ten Houses	J. Sampson	Salt Lake House, co. Down.
,, 4	Nelson—Free Library	Corporation	J. H. Baldwick, Town Hall, Nelson.
,, 31	Taunton—School	Education Committee	G. H. Kite, Municipal Buildings, Taunton.
	ENGINEERING:		
eb. 17	Cape Clear, co. Cork—Breakwater, &c.	—	Assistant Surveyor of Buildings, 1 River View, Summer Hill, Cork.
,, 17	London, E.C.—Engines, &c.	E. Argentine Railway Co., Ltd.	Co., Winchester House, 50 Old Broad Street, E.C.
,, 17	Pentre, Glam.—Lining Tank	Urban District Council	O. Thomas, Gas and Water Offices, Pentre, Glam.
,, 18	Bury, Lancs—Waterworks, &c.	Water Board	J. Cartwright, Peel Chambers, Bury.
,, 18	Chapel-en-Frith—Waterworks	Rural District Council	Swann & Brady, Town Hall, Chapel-en-Frith.
,, 20	Hamilton, N.B.—Septic Tanks	Town Council	Wyllie & Blake, 219 St. Vincent Street, Glasgow.
,, 20	Batley—Wiring, &c.	Co-operative Society, Ltd.	H. B. Buckley, 85 Commercial Street, Batley.
,, 20	Kilkenny—Tell-tales	Committee of District Asylum	Asylum, Kilkenny.
,, 20	Hunslet, Leeds—Sewage Works	Rural District Council	C. H. Marriott & Son & Shaw, Church Street Chambers, Dewsbury
,, 21	Manchester—Motor-Generators, &c.	Electricity Committee	F. E. Hughes, Electricity Department, Town Hall, Manchester.
,, 21	Swindon—Switch Panels	Corporation	J. G. Griffin, Electricity Works, Swindon.
,, 21	Beccles—Gas Plant	Gas Co.	Engineer, Beccles Gas Co.
,, 22	Newcastle-under-Lyme, Staffs—Pumping Machinery	Corporation	Wilcox & Raikes, 63 Temple Row, Birmingham.
,, 22	London, S.W.—Condensing Plant	Fulham Borough Council	A. J. Fuller, Town Hall, Fulham.
,, 23	Dublin—Arc-Lamp Carbons	Corporation	City Engineer, City Hall, Dublin.
,, 24	Chelmsford—Pumping Machinery	Rural District Council	J. Dewhirst, Avenue Chambers, Chelmsford.
,, 27	Copenhagen—Gasmeter	Corporation	Valby Gasworks, Valbys, Copenhagen.
,, 27	Salford—Heating Schools	Education Committee	C. K. & T. C. Mayor, 41 John Dalton Street, Manchester.
,, 28	Ashton-in-Makerfield—Gas Plant	Urban District Council	Gasworks, Ashton-in-Makerfield.
arch 1	Southsea—Reconstructing Pier-head	S. Parade Pier Co.	G. E. Smith, 145 Victoria Road N., Southsea.
,, 1	Naas, Ireland—Reservoir Tank	Rural District Council	D. J. Purcell, Council Offices, Nass.
,, 1	Wrexham—Sewage Tanks	Town Council	J. W. M. Smith, Borough Engineer, Wrexham.
,, 3	Conwil Cayo—Steel Girder Bridge	Rural District Council	J. E. Lloyd, 29 High Street, Lampeter.
,, 31	Shanghai—Electric Tramways	Municipal Council	J. Poor & Co., 63 Leadenhall Street, E.C.
pril 1	Lulea, Sweden—Dredging	—	Harbour Office, Lulea, Sweden.
,, 10	St. George's Harbour, Bermuda—Deepening, &c., Channel	Government	Coode & Son & Matthews, 9 Victoria Street, S.W.
ay 1	Suakin (Red Sea)—Lighthouse	Ports and Lights Administration	Deputy-Controller-General, Ports and Lights Administration, Alexandria, Egypt.
	IRON AND STEEL:		
eb. 16	Canterbury—Iron Manhole-covers, &c.	Roads and Survey Committee	A. C. Turley, City Surveyor, Canterbury.
,, 16	Sutton, Surrey—Railings	Urban District Council	Engineer to Council, Sutton.
,, 18	Richmond, Surrey—Ironmongery, &c.	Town Council	T. B. Senior, Town Hall, Richmond.
,, 18	Chapel-en-Frith—Pipes	Rural District Council	Swann & Brady, Town Hall, Chapel-en-Frith.
,, 20	London, N.E.—Ironmongery	Bethnal Green Borough Council	Borough Surveyor, Town Hall, Bethnal Green.
,, 20	London, N.—Ironmongery, &c.	Hornsey Town Council	R. J. Lovegrove, 99 Southwood Lane, Highgate.
,, 21	Barrow-in Furness—Cast-iron Pipes	Corporation	Manager, Gas and Water Works, Barrow-in-Furness.
,, 22	London, S.W.—Wrought-iron Piping	—	Crown Agents for Colonies, Whitehall Gardens, S.W.
,, 23	Chatham—Fencing	Town Council	C. Day, Town Hall, Chatham.
,, 27	Urmston, Lancs—Gates and Railings	Urban District Council	Council's Surveyor, Urmston, Lancs.
arch 1	Stoke-on-Trent—Cast Ironwork	Corporation	A. Burton, Town Hall, Stoke-on-Trent.
,, 2	Southend-on-Sea—Iron, Steel, &c.	Corporation	E. J. Elford, Borough Surveyor, Southend.
,, 7	Brisbane, Australia—Rails, &c.	—	Agent-General for Queensland, 1 Victoria Street, S.W.
	PAINTING AND PLUMBING:		
eb. 17	Dowlais, Wales—Painting, &c., Inn	—	C. M. Davies, 112 High Street, Merthyr.
,, 18	Plymouth—Paint and Oil	Corporation	J. Paton, Borough Engineer, Plymouth.
,, 20	London, N.—Paints and Oils	Bethnal Green Borough Council	Borough Engineer, Town Hall, Bethnal Green.
	ROADS AND CARTAGE:		
eb. 16	Canterbury—Gravel and Stone	Roads and Survey Committee	A. C. Turley, City Surveyor, Canterbury.
,, 16	Croydon—Road Materials, &c.	Rural District Council	E. J. Gowen, Town Hall, Croydon.
,, 16	East Retford—Granite	—	J. D. Kennedy, Borough Surveyor, East Retford.
,, 16	Stockport—Paving, &c., Carriageway, &c.	Corporation	J. Atkinson, Borough Surveyor, Stockport.
,, 16	Stokesley—Whinstone, &c.	Rural District Council	W. H. Dixon, Kirkby-in-Cleveland, near Stokesley.
,, 17	Urmston, Lancs—Paving, &c.	Urban District Council	J. Heath, Council Offices, Urmston.
,, 17	Horncastle, Lincs—Granite	Rural District Council	Council Offices, Horncastle, Lincs.
,, 17	Skipton—Road	Rural District Council	A. Rodwell, Surveyor, Skipton.
,, 18	Plumpton, Sussex—Road-making	Small-pox Hospital District Committee.	J. Miles, 173 High Street, Lewes.
,, 18	Sibsey, Boston, Lincs—Granite and Slag	Rural District Council	J. M. Simpson, Clerk to Council, Boston, Lincs.
,, 18	Salford—Asphalt, &c.	Electricity Department	Borough Electrical Engineer's Office, Frederick Road, Pendleton.

Complete List of Contracts Open.—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		ROADS AND CARTAGE—*cont.*		
Feb.	18	St. Thomas, near Exeter—Road Materials	Rural District Council	A. E. Ward, 9 Bedford Circus, Exeter.
,,	18	Richmond, Surrey—Cartage of Road Materials	Town Council	F. B. Senior, Town Hall, Richmond.
,,	20	London, N.E.—Flints, &c.	Bethnal Green Borough Council	Borough Surveyor, Town Hall, Bethnal Green.
,,	20	Hornsey—Road Materials, &c.	Town Council	E. J. Lovegrove, 99 Southwark Lane, Highgate.
,,	20	Beckenham—Making-up Roads	Urban District Council	J. A. Angell, Surveyor to Council, Beckenham.
,,	20	Beverley—Stone	Highways Committee	E. Picker, Surveyor, Beverley.
,,	20	Rawtenstall, Lancs—Road Materials	Corporation	Borough Surveyor, Municipal Offices, Rawtenstall.
,,	20	Surbiton—Road Materials, &c.	Urban District Council	Council Offices, Ewell Road, Surbiton.
,,	21	Masham, Yorks—Road Repairs	Urban District Council	C. F. P. Edmundson, Clerk, Masham.
,,	21	Sowerby Bridge—Street Works	Urban District Council	Surveyor's Office, Town's Buildings, Sowerby Bridge.
,,	22	Aylesbury, Bucks—Granite	Highways Committee	R. J. Thomas, County Hall, Aylesbury.
,,	22	Headington, Oxford—Road Materials, &c.	Rural District Council	J. C. Coates, Hartfield Cottage, New Headington.
,,	22	Wanstead, Essex—Making-up Streets	Urban District Council	Surveyor's Department, Council Offices, Wanstead.
,,	23	Escrick, York—Whinstone, &c.	Rural District Council	F. A. Camidge, 3 Stonegate, York.
,,	24	Honiton, Devon—Road Materials, &c.	Rural District Council	E. W. Hellier, Clerk, Honiton.
,,	25	Stratton, Cornwall—Road, &c.	Rural District Council	W. J. Dunbar, Liskeard, Cornwall.
,,	26	Harrogate—Street Works	Corporation	F. Bagshaw, Borough Engineer, Harrogate.
,,	27	Old Hill, Staffs—Road Stone	Rowley Regis U.D.C.	Council Offices, Lawrence Lane, Old Hill.
,,	28	Hatfield, Herts—Granite and Slag	County Council	U. A. Smith, County Surveyor, Hatfield.
,,	28	Ealing, W.—Road	Town Council	Charles Jones, Town Hall, Ealing.
,,	28	Brighouse—Street Works	Corporation	S. S. Haywood, Municipal Offices, Brighouse.
,,	28	Lewes—Road Materials	East Sussex County Council	F. J. Wood, County Hall, Lewes.
,,	28	London, S.W.—Roads, &c.	London County Council	Housing of Working Classes Section of Architects' Department, Charing Cross Road, W.C.
,,	28	London, S.W.—Cartage of Granite	Middlesex County Council	H. T. Wakeham, Middlesex Guildhall, Westminster, S.W.
		SANITARY:		
Feb.	16	Canterbury—Disinfectant Fluid and Powder	Roads and Survey Committee	A. C. Turley, City Surveyor, Canterbury.
,,	20	London, N.E.—Drain Pipes	Bethnal Green Borough Council	Borough Surveyor, Town Hall, Bethnal Green.
,,	21	Stanley, Durham—Sewers	Urban District Council	J. Routledge, Council Offices, Stanley.
,,	22	Newcastle-under-Lyme—Sewers	Corporation	Willcox & Raikes, 63 Temple Row, Birmingham.
,,	28	Stony Stratford and Wolverton—Sewerage Works	Rural District Council	A. E. Abbott, The Square, Wolverton.
Mar.	1	Wrexham—Sewer	Corporation	J. W. M. Smith, Borough Surveyor, Wrexham.
,,	1	Stoke-on-Trent—Disinfectants	Corporation	A. Burton, Town Hall, Stoke-on-Trent.
,,	2	Southend-on-Sea—Disinfectants	Corporation	E. J. Elford, Borough Surveyor, Southend-on-Sea.
,,	4	Bilston, Staffs—Sewage-disposal Works	Urban District Council	J. D. Wassell, Town Hall, Bilston.
,,	7	Boston, Lincs—Sewers	Urban District Council	J. Rowell, Church Lane, Boston.
		TIMBER:		
Feb.	20	London, W.—Timber	Great Western Railway Co.	G. R. Mills, Secretary, Paddington, W.

List of Competitions Open.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Feb.	28	Aylesbury—School	£50 & £25	£1 1s.	C. G. Watkins, Education Office, Aylesbury.
,,	28	Wolverton—School	—	£1 1s.	C. G. Watkins, Education Office, Aylesbury.
Mar.	4	Nelson, Lancs—Library	£50, £25 & £15	—	J. H. Baldwick, Town Hall, Nelson.
,,	30	London, S.W.—Municipal Buildings	—	£1.	H. J. Smith, Town Hall, Kennington, S.W.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

Coming Events.

Wednesday, February 15.

Society of Arts.—Mr. Arthur Henry Anderson on "The Decline of the Country Town," at 8 p.m.

Royal Sanitary Institute. — Inspection and Demonstration at Islington at 2 p.m., conducted by Mr. James R. Leggatt.

Institute of Sanitary Engineers.—Election Committee, Examination and Literary Committee, Finance Committee and Organizing Committee, at 3 p.m. Mr. J. Thompson on "The Sanitation of Southend-on-Sea," at 7 p.m.

Institution of Civil Engineers.— Students' Visit to the "Underground" electricity generating station at Lot's Road, Chelsea, at 2.30 p.m. Dinner by Sir Guilford Molesworth, president, to the council and honorary members, at 8 p.m.

Architectural Association (Discussion Section). —Mr. James B. Fulton on "The Use of the Axial Line in Planning," at 7.30 p.m.

Edinburgh Architectural Association.—Rev. Prof. Cooper on "A Minister's Thoughts in regard to the Arrangement and Furnishing of a Parish Church," at 8 p.m.

Thursday, February 16.

Society of Architects.—Mr. S. R. Tucker on "The Lighting of Buildings by Electricity and Incandescent Gas," at 8 p.m.

Royal Academy.—Mr. Alfred Gilbert, R.A., on "Sculpture," at 4 p.m.

Friday, February 17.

Institution of Mechanical Engineers. — Adjourned discussion on the American visit, 1904. Prof. W. E. Lilly on "The Strength of Columns," at 8 p.m.

Northern Architectural Association (Students' Sketching Club).—Annual Gathering and Exhibition of Sketches and Drawings from 7.30 to 10.30 p.m.

Saturday, February 18.

Royal Sanitary Institute. — Inspection and Demonstration at Willesden Parish Infirmary at 3 p.m., conducted by Mr. Alfred Saxon Snell, F.R.I.B.A.

Edinburgh Architectural Association. — Dinner at 7 p.m.

Monday, February 20.

Royal Philosophical Society of Glasgow.— Mr. Robert Paterson on "The House as a Place to Live in," at 8 p.m.

Liverpool Architectural Society.—Mr. G. E. Thompson. Plates of "Architecture of Many Countries."

Royal Institute of British Architects.— Mr. Reginald Blomfield, M.A., A.R.A., on "Architectural Education," at 8 p.m.

Royal Academy.—Professor Aitchison, R.A., on "Vitruvius," at 4 p.m.

Tuesday, February 21.

Northern Architectural Association. — Students' meeting at 7 p.m. Annual General Meeting, Election of Committee, Discussion of Prize Essays.

Society of Arts.—Mr. Marion H. Spielmann, F.S.A., on "The Queen Victoria Memorial as compared with other Royal Memorials," at 8 p.m. (Mr. John Belcher, A.R.A., P.R.I.B.A., will preside.)

Wednesday, February 22.

Royal Sanitary Institute. — Inspection and Demonstration at Islington by Mr. James R. Leggatt, Supt., Public Health Dept., Islington, at 2 p.m.

Edinburgh Architectural Association.—Mr. Charles E. Elcock on "Through York with a Camera," at 8 p.m.

Thursday, February 23.

Leeds and Yorkshire Architectural Society. —Mr. Maurice B. Adams, F.R.I.B.A., on "More about Modern Libraries," at 6.30 p.m.

Royal Academy.—Professor Aitchison, R.A., on "Vitruvius," at 4 p.m.

Friday, February 24.

Glasgow Technical College Architectural Craftsmen's Society. — Mr. Colin Sinclair on "Steel Construction," at 8 p.m.

Architectural Association.—Mr. F. J. Osborne Smith, A.R.I.B.A., on "Country Houses and Accessory Buildings," at 7.30 p.m.

Saturday, February 25.

Royal Sanitary Institute. — Inspection and Demonstration at the Battersea Disinfecting Station, Mortuary and Shelter, by Dr. G. F. McCleary, at 2.15 p.m.

Builders' Foremen's Association.—Mr. F. M. H. Jones on "Slag-wool," Memorial Hall, Farringdon Street, E.C.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—publi examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

During the week ending February 10th twenty-nin failures in the building and timber trades in Englan and Wales were gazetted.

H. J. Harrop, builder, Lewisham. R.O. Jan. 31st.

A. E. Townsend, builder, London. Liabilities £2,540 estimated surplus assets £382.

F. Kemp, builder, Hove. Liabilities £1,941; asset £186.

W. Sanders, builder, Rottingdean. Liabilities £1,124 assets £276.

E. Jelly & Co., painters and decorators, Maidenhead P.E., Windsor Town Hall, March 4th, at 11.

W. H. Young, builder, Twyford. P.E., The Castle Winchester, Feb. 20th, at 11.

Collings Brothers, house decorators and electricians, Blackheath. R.O. Feb. 1st.

J. Sinclair, builder, Catford. P.E., Greenwich C.C. Feb. 28th, at 1.

J. Driver, plumber, glazier and gasfitter, Colne. R.O Feb. 2.

A. E. Harris, builder and contractor, Hounslow. R.O Feb. 1st.

J. T. Jones, plumber and glazier, Saltburn-by-the-Sea R.O. Feb. 3rd.

F. G. Powley, builder, King William Street, E.C R.O. Feb. 1st. First meeting, London Bankruptcy Cour Feb. 22nd, at 2.30. P.E., same, March 17th, at 11.30.

H. Harland, painter, contractor and plumber, Hanley First meeting, O.R.'s, Newcastle, Feb. 15th, at 11. P.E Hanley Town Hall, Feb. 22nd, at 10.30.

E. Spicer, builder, Mortlake. First meeting, 24, Rai way Approach, London Bridge, Feb. 17th, at 12.3 P.E., Wandsworth C.C., Feb. 23rd, at 12.

S. Flowitt, builder, Doncaster. First meeting, O.R.'s Sheffield, Feb. 15th, at 12. P.E., Sheffield C.C., Feb 23rd, at 2.

C. Stevenson, joiner and builder, Huddersfield. R.O Jan. 28th. First meeting, O.R.'s, Huddersfield, Feb. 16th at 3. P.E., Huddersfield C.C, March 13th, at 2.

W. Vickerman, contracting joiner, Hull. First mee ing, O.R.'s, Hull, Feb. 15th, at 11. P.E., Hull C.C Feb. 20th, at 2.

Munday & Co. (A. L. Kirkland), painters and decor tors, Southend-on-Sea. P.E., Chelmsford Shire Hal March 1st, at 10.

P. Fitzpatrick contractor, Hackney. R.O. Feb 2nd First meeting, London Bankruptcy Court, Feb. 16th, 12. P.E., same, March 16th, at 11.

THE

BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

February 22, 1904. Vol. 21, No. 524. 6, Great New Street, Fetter Lane, E.C.

Summary.

In the foundations for the new offices for the "Dundee Courier" reinforced concrete piles are used, laced together at the heads by reinforced concrete beams. Each pile is 28ft. long, 14ins. square and weighs over 2 tons. (Page 98.)

M. Rodin, speaking of modern architecture, says he sees nothing that gives encouragement. There are intelligent men sufficiently educated, who ferret out the style of Nineveh as well as the styles of Louis XIV. and Louis XV., but they only repeat, as parrots. "For long years we have done nothing but turn out from our colleges young men stuffed with useless scientific lumber; and they very quickly lose it all, and there is nothing to take its place." (Page 107.)

In forming the new tunnel on the Midland Railway at Alfreton it was not possible to work from the ends, so five shafts were sunk along the centre-line and the tunnel driven from each in both directions. There was no appreciable error in alignment, though only an ordinary 5in. transit theodolite was used for setting-out. (Page 105.)

Addressing students of the Birmingham Municipal School of Art, Mr. Edward S. Prior said that when the time came to erect a cathedral for the city why should they not build it as architect-masons and architect-carpenters, sculpture it as craft-sculptors, and decorate it as craft-painters, smiths, glaziers and tile-makers? (Page 106.)

The Building By-laws Reform Association has drawn up a new set of draft by-laws for rural districts, and also a Bill to exempt altogether certain buildings from the operation of by-laws other than those relating to sanitation. (Page 105.)

King's Cross used to be called Battle Bridge. (Page 106.)

There is a deadly list of petitions against the London Building Acts Amendment Bill. (Page 106.)

In a paper which he read before the Society of Architects last Thursday Mr. B. R. Tucker stated that for lighting a large room it was preferable to have a reasonable number of separate lights rather than one large light placed centrally. In open arc lamps the upper carbon burnt away at the rate of about 2ins. per hour. In enclosed arc lamps the consumption was much less, being only ⅛in. per hour, so that these lamps would burn for about 100 hours without re-trimming. The Nernst lamp had an average life of 300 to 400 hours, and was about three times as efficient as the ordinary incandescent electric lamp. Among incandescent gas burners the latest types were the "Lucas" and the "Khoma," the former giving 200-c.p. with a consumption of 6 cub. ft. of gas per hour and the latter giving 150-c.p. with 4 cub. ft. per hour. (Page 99.)

Acoustics. It is a surprising thing that such an important subject to the architect as acoustics should be generally ignored, and little or no attempt made to enquire into the matter. Until the last few years ventilation was another subject to which this same criticism might have applied, and even now the majority of architects seem to have no definite opinions as to the efficiency of different systems for various purposes. Engineers, too, seem bewildered. Maybe this is due to the intangible nature of air. Scientists have not yet solved the problems of aëronautics, and yet we must all feel that to continue in ignorance of the laws and nature of air—that substance we depend upon for our health and hearing—is somewhat of a disgrace. The books that are published on the subject of acoustics give little aid—they are generally filled with accounts of experiments and mathematical discussions of wave lengths, musical instruments, and the anatomy of the ear, hardly any attention being paid to the sound-effect due to the shape and construction of buildings. In his book Prof. T. Roger Smith, who took up the subject from an architect's point of view, gives numerous examples of actual buildings, but he performed few experiments. His analysis of the facts was therefore superficial, and he thought the shape and size was all-important. But when examples were erected correctly proportioned as to rigid numerical ratios, even to details, the results were wholly unexpected. Even compartments duplicating the shape of others good acoustically, were found to be bad. Naturally the conclusion was come to by the few who chose to investigate it that the materials of which the buildings were constructed had their importance. Prof. W. C. Sabine in the United States has recently investigated the subject and proved from a number of experiments that materials possess the power of absorption in varying degrees, and that the shape makes little difference. From the fact that sound is energy, this should have been apparent to any scientist at first, but one is always wise after the event. It has now been established that the duration of sound in a compartment depends upon two factors: the volume of the contained air and the absorptive capacity of the materials of its structure and contents. Each time waves of sound are reflected from a surface, part of their energy is absorbed, and the duration of a sound depends upon the speed with which it is absorbed. In a long building with particularly non-absorptive materials the sound is so loud when reflected, and takes so long to travel, that when it arrives back it produces an echo. If this does not happen, then the residual sound blurs hearing; a certain residual amount is of advantage in a music room as it diminishes the staccato character of successive notes.

To Control London Street Architecture. Sir William Richmond's proposal that the London County Council should appoint a special committee "to advise the Council upon all proposals involving permanent or constructive work, or designs in the selection of which artistic knowledge and taste are requisite," is a praiseworthy effort to get a fixed policy in regard to artistic matters adopted by one at least of the authorities that be. Parliament has often been asked to appoint a Minister of Fine Arts, and to encourage the arts in England as they are encouraged in France, but has been unencouraging (in fact, hardly interested) and sometimes hostile and philistine. The London County Council has been more progressive in this respect, and the appointment of Sir William Richmond as an alderman was a recent instance of its appreciation of the importance of art in the enlightenment of the public and the betterment of their surroundings—of its utilitarian value in the truest sense of the word. If the Council will but lead the way in appointing such a body as proposed by Sir William Richmond it will establish a precedent that may eventually produce some real improvement in our public monuments and streets and, by reflection, in the design of private buildings. The following names are proposed for the committee—The presidents of the Royal Academy, the Royal Institute of British Architects, the Society of Antiquaries and the Institution of Civil Engineers; two sculptors, Mr. Brock, R.A., and Mr. Frampton, R.A.; two architects, Mr. Jackson, R.A., and Mr. Reginald Blomfield, A.R.A.; one painter, Sir Lawrence Alma-Tadema, R.A.; the Earl of Carlisle, Lord Windsor and Lord Balcarres. These names we do not quarrel with; we would only suggest the addition of the president of the Surveyors' Institution, Prof. W. R. Lethaby (as one of the Council's present art advisers and examiners, and head of their Arts and Crafts School in Regent Street) and Mr. Beresford Pite as professor of architecture at South Kensington. If such a body were to have submitted to them all the drawings of proposed buildings in London put before the Building Act Committee and to privately submit their suggestions to the architects as friendly comment, it would be a great advantage.

VIEW SHOWING COMPLETED PILES AND OTHERS IN MOULDS.

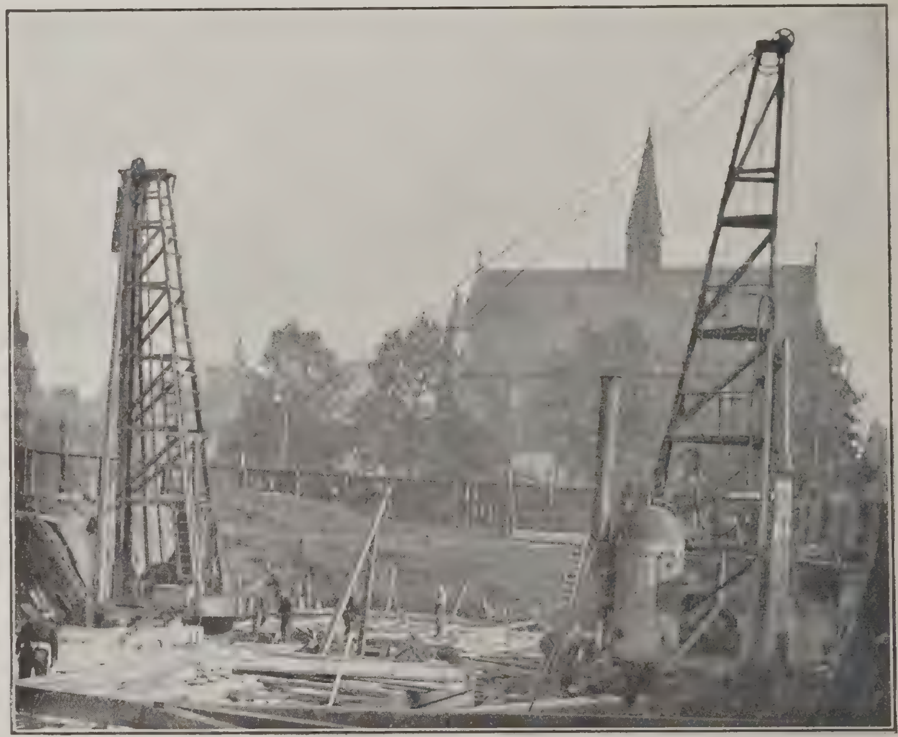
FOUNDATION WORK IN REINFORCED CONCRETE.

A MOST interesting example of reinforced-concrete construction, on the Hennebique system, is afforded by the large block of new premises now being erected for the Dundee "Courier" from designs by Messrs. Niven & Wigglesworth, architects, of 104, High Holborn, London, W.C. It is not possible for us to give a perspective of the building at present, but through the courtesy of the proprietors of the "Courier" we are able to reproduce a number of photographs showing the work in progress. Before proceeding to deal with this in detail we may state that the building will be seven storeys high (including basement and Mansard) and will have walls of stone from Dumfriesshire quarries. It is Renaissance in style and presents a very fine front to Meadowside. The counting-house and advertisement department will be on the street level, editorial departments on intermediate floors, and the composing-room at the top. The printing machines will not be in the main structure, but in a separate building in Euclid Crescent. The site is probably the finest in Dundee. It was formerly partly occupied by the old post-office; opposite is the Albert Institute (designed by Sir G. Gilbert Scott), containing the art galleries and the Dundee free library; to the north is the Classic front of the High School, with the Royal Exchange adjoining; and to the south Reform Street, with Lamb's Hotel, the National Bank of Scotland, the Bank of Scotland, and, at the further end, the Townhouse and city offices. The total cost of site and buildings will be about £60,000.

Work was commenced last summer, the contractor being Mr. Thomas C. Stocks, of Dundee. To secure a good foundation a large number of reinforced-concrete piles have been driven, and on them is formed a box basement, with retaining walls of concrete.

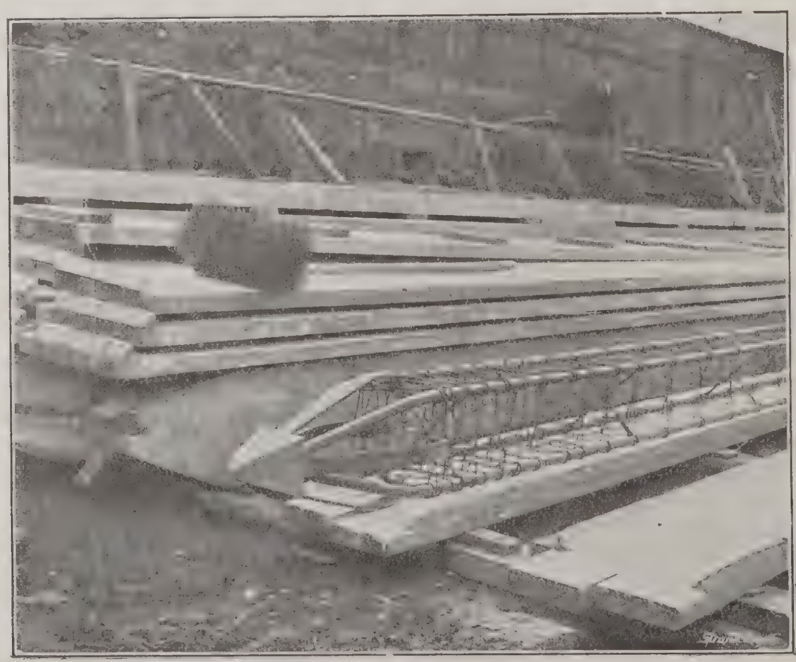
The piles are built up with a square framework of $1\frac{1}{8}$in. steel rods attached to a shoe at the base and laced with smaller steel rods. This skeleton is lifted into a box and tightly packed around with concrete, the material being driven in with rammers. When the concrete has set, the sides of the box are taken down, disclosing a pile 28ft. long, 14ins. square and weighing over 2 tons. The specification for the ordinary reinforced concrete states the proportions to be:—Gravel (free of sand) of all sizes between $\frac{1}{8}$in. and $\frac{3}{4}$in., 27 cub. ft. (gravel of one uniform size to be carefully avoided); sand $13\frac{1}{2}$ cub. ft.; cement 6 cwts. For the piles the proportions are:—Gravel 27 cub. ft., sand $13\frac{1}{2}$ cub. ft., cement $7\frac{1}{4}$ cwts. This mixture when in place and properly rammed yields a volume of concrete of 31 cub. ft. The pile-drivers carry "monkeys" weighing 2 tons each, and the drives are made at the rate of thirty per minute. To prevent the concrete being smashed, the pile is crowned with a cast-iron "helmet" fitted with a block, or "dolly," of elm, which softens the impact.

The piles are not sunk indiscriminately but grouped together at the points where the weight of the building will be received. They are mostly placed in groups of five, and the first pile of a set generally drives to nearly its entire length; but as the soil becomes consolidated the resistance increases, and the last of the five never drives to full depth. All, however, are finished off at ground level, the concrete being chipped through and the steel rods sawn across about a foot above ground. Transverse rods are then laid from one pile head to the next, and these in turn are sheathed in concrete, so that in effect all the piles are laced together by massive beams of reinforced concrete. Upon these a floor of such concrete, 7ins. thick, is laid. The piling, it must be understood, is carried on at what would in ordinary cases be foundation level, about 11ft. below the street. Each pile is capable of carrying 175 tons, but no single one will require to take more than 50 tons, the approximate weight of the building being about 6,000 tons.



PILE DRIVERS.

Retaining walls of reinforced concrete are built up to the level of the street, and about 3ft. within these are being erected the piers which will carry the super-structure. Over each set of five piles one of the piers is placed, the steel rods which form the core of the piles being linked to similar rods which run through the piers, so that the whole is homogeneous. Over the smaller groups of three piles, piers less massive are built to support the floors; at street level these being also connected with reinforced-concrete beams, on which the first or street floor (of reinforced concrete 4ins. thick) is laid.



SKELETON FRAMEWORK OF REINFORCED CONCRETE PILE.

The piers are larger in area than the piles upon which they rest, and therefore upon the heads of the piles a kind of reinforced concrete bracket-capital is formed. The basement is to be lighted by pavement lights (the piers being set back within the retaining walls for this reason) and by stallboard lights, bulkheads being formed in concrete where these latter occur (see p. 102). The retaining walls have piers at intervals, with horizontal beams between half-way up the height, so as to give stiffness. The clerk of works on the job sends to the architects each week a report on the progress of the work, with the number of men employed, visitors, &c. We give below the report for the week ending Saturday, February 11th, to show its character :—

RETURN OF WORKS EXECUTED AT "COURIER" NEW OFFICES, DUNDEE.
Report No. 36, for Week ending Saturday, February 11th, 1905.

Workmen employed.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Occupation of Workmen.
Bricklayers							Carpenters are engaged on preparation of ferro-concrete centering. Masons are at work on hewing for first floor and polishing work for ground floor. Wallers are fixing hewn work on Albert Square and Meadowside elevations. Labourers are engaged on site in connection with walling and masonry. Plasterers are filling up holes in basement ceilings and rendering and making good walls in basement. Smiths are preparing steel for ground-floor beams. General labourers are engaged clearing up basement floor, on ballast crushing, forming beams at south end of ground floor, and laying floor at this end. Carpenters are forming circular faced beam at staircase bay and finishing centering at south end of ground floor.
Labourers							
Excavators							
Scaffolders							
Slaters							
Carpenters	9	9	9	9	5	5	
Joiners							
Masons	14	14	14	14	14	14	
Labourers	12	12	12	12	12	12	
Wallers	5	5	5	7	9	10	
Plasterers		1	1	1	2	2	
Labourers							
Plumbers							
Painters							
Glaziers							
Smiths, hammerman and boys	4	4	4	4	4	4	
General labourers	20	20	20	20	16	16	
Foreman	1	1	1	1	1	1	
Total number of men	65	66	66	68	63	64	
State of the weather	No time lost through stress of weather.						

State of the Works and Materials on Ground.	Questions to be Asked and Drawings Required.
The first two arches on Meadowside elevation, north end, are complete ; the third pier on same elevation is four courses above base course. The two piers on Albert Square elevation are at the height of springing-stone, and corner pier on Euclid Crescent and Albert Square is at ground-floor level. The hewn work for first floor is well in hand. The power wires to motor for crane are fixed, but current is not yet on. The beams are all formed in ferro-concrete at south end of ground floor, retaining wall against old gable is up, and a portion of the floor laid. The centering for circular faced beam on staircase bay is prepared. The making-good of holes in ceiling of basement is partly done, and end wall, Albert Square, is rendered and floated. There is trouble keeping out the water in sunk portion under staircase, and it may be that a portion of the concrete must come up yet.	

DRIVING IN A PILE.

THE SOCIETY OF ARCHITECTS.

Lighting by Electricity and Gas.

AT last Thursday's meeting of the Society of Architects a paper on the lighting of buildings, &c., by electricity and incandescent gas was read by Mr. B. R. Tucker (member of the council of the Society, member of the Royal Sanitary Institute, and late chief surveyor, War Office). After some introductory remarks Mr. Tucker said that the average amount of light required for reading and writing might be taken at 1 candle-foot ; this, however, depended on the nature and extent of the reflecting surfaces influencing the light ; for work with much detail, or on coloured materials, not less than 5 candle-feet should be provided. The general legal standard of light was the standard candle—a spermaceti candle of certain dimensions, weighing one-sixth of a pound avoirdupois and burning 120 grains per hour. From this a standard of light was obtained which, at a distance of 1ft. from the object illuminated, produced an illumination equal to 1 candle-foot or, as generally expressed, "1 candle-power." At other distances the illuminating power was determined by the "law of inverse squares," which stated that the intensity of light varied inversely as the square of the distance ; thus at 2ft. the intensity was reduced to one-fourth of that at 1ft., the same rays of light having to cover four times the area. The measurement of the light was made by a photometer, the principles of which depended on the law of inverse squares. This law proved that to obtain the best result with economy in lighting it was necessary in the case of a large room or building that it should have a reasonable number of separate lights judiciously distributed, instead of a large single light or lights placed centrally in it. The lights should be of such a nature and so placed as to produce a minimum illumination of, say, about 1 candle-foot at the parts farthest from the light. The best light was a soft well-diffused one, usually obtained by employing ground glass globes, &c.

Of electric lamps there were three kinds—arc lamps, Nernst lamps and incandescent lamps. Arc lamps were of two kinds—open and enclosed.

The Open Arc Lamp

was the most intense artificial illuminant, its light being produced by sending a continuous or alternating current between two slightly separated carbon rods. In an ordinary arc lamp the upper carbon was the *positive*, fed slowly downwards by solenoid mechanism as fast as it was consumed. At its lower end this carbon fairly boiled away into vapour, producing a slight hollow in the centre of the end known as the "crater." The lower carbon, or *negative*, was evenly and somewhat sharply pointed—if the arc was short, particles of carbon were torn off from the surface of the crater in the upper carbon and many of them were deposited on the lower carbon. With a direct current the upper carbon would burn away twice as fast as the lower (if of the same diameter), generally at the rate of about 2ins. per hour. The carbons were usually of $\frac{1}{3}$in. diameter, and the upper (and sometimes the lower also) had a soft core of carbon in the centre about $\frac{1}{16}$in. diameter ; this portion more easily fused and produced a greater mass of carbon vapour, which tended to hold the arc centrally between the carbons. The rays of light from this lamp came chiefly from the "crater," and fell at an angle of 40 degs. below the horizontal.

The Enclosed Arc Lamp

had its arc enclosed within a globe which practically excluded the air. The ends of the carbons kept fairly flat, the arc filling only a portion of the space between the

PILE DRIVER, AND BEAMS INTERLACING REINFORCED CONCRETE PILES.

carbons and travelling slowly from one part to the other. The carbons in this lamp were consumed only at the rate of $\frac{1}{8}$in. per hour, so that they would burn from 80 to 120 hours or more without retrimming. The arc was much longer, and the downward obstruction of the light by the lower carbon was greatly reduced. The advantages of this lamp consisted in the saving in the cost of carbons and the saving of labour in retrimming, while the inner globe—being often of opal glass—ensured a better diffusion of light. The lamp also gave a much rounder and fuller distribution of light; and although, with the same energy, the minimum light was only a little more than half that of the open arc, yet the better distribution of light fully compensated for the difference. For interior lighting the outer globes were sometimes of opal or ground glass, so that the bluish tinge produced by a long arc was partially eliminated. Several enclosed arc lamps were now in use fitted with one globe only, and were giving greater satisfaction than those having two globes, as they afforded a greater and better diffusion of light. Opal globes absorbed from 50 to 60 per cent. of the light, ground glass (according to its density) from 30 to 50 per cent., and clear glass about 10 per cent. Arc lamps of the inverted type were often used in studios, factories, &c., the rays being thrown on a white ceiling, whence they were reflected, producing a most pleasing effect.

The Nernst Lamp

came between the arc lamp and the incandescent lamp. The light was obtained by making incandescent a filament of mixed oxides, generally from 1in. to 1½ins. in length and placed either horizontally or vertically. The filament when cold was a low conductor, but when heated by a coil around it became a better conductor, and then was made vividly incandescent. This filament could not be run without a resistance, which was necessary to prevent the light becoming unstable. The filament being incombustible, it was not necessary to place it in vacuum, as with the incandescent lamp. The lighting of the Nernst lamp occupied a short time, and no doubt that was one of its drawbacks, together with the frequent breakdown of the filament and heating coil, owing to vibration. The average life of the burner was from 300 to 400 hours. The efficiency of the lamp was extremely high, being ·95 watts per c.p. on a 100-volt circuit and ·88 watts on high-voltage circuits. A 1-ampere lamp would give 105-c.p. on a 100-volt circuit and 250-c.p. on a 220-volt circuit, this being practically three times the amount of light given by the ordinary incandescent lamp consuming the same amount of current.

The Incandescent Electric Lamp

in general use consisted of a carbon filament possessing a high resistance and of sufficient strength to ensure a fair life. Except those for special lamps of great candle-power, the filaments were made of soluble cellulose threads, hardened, carbonized and "treated."

Other things being equal, the life of the lamp practically depended on the temperature employed. There was a steady disintegration and vaporization of the filament during incandescence, producing a decided increase in the resistance, and a consequent decrease of current, temperature and light. An ordinary low-efficiency 100-volt 16-c.p. lamp took about ·6 amperes; at 200 volts about ·3 amperes, and at 250 volts about ·24 amperes. Lamps could be obtained of three classes—low, medium and high efficiency, absorbing respectively from 2½ to 4 watts per candle-power. On the whole, the best result was obtained by using lamps requiring 3 to 3·5 watts per candle-power. Practically, the Board of Trade unit was equal to the current required for No. 16—16 candle-lamps per hour. The rate per

CONSTRUCTING THE BEAMS INTERLACING THE HEADS OF REINFORCED CONCRETE PILES.

AT WORK ON ONE OF THE RETAINING WALLS.

unit for electrical current in the City of London varied from 2½d. to 5d. In one business house 2½d. was charged per unit for current used in the day-time in the basement, 3½d. for that used on the ground floor, and 4½d. for the floors above.

Incandescent Gas Light.

Turning to this light, Mr. Tucker said it was the result of two important discoveries, namely, the Bunsen burner and the incandescent mantle. About fifty years ago Bunsen invented the atmospheric burner which bore his name. By this a non-luminous gas flame was produced by mixing coal gas with a certain proportion of air, the proportion being generally about 1 to 5 or 6. The discovery of Baron von Welsbach, in 1886, led to the production of a mantle of refractory oxides, having as a base that wonderful and rare earth or oxide of the metal thorium, known as thorea; while the further and more wonderful discovery in 1891-1892 of the power exerted upon thorea by having a trace of ceria mixed with it led to the production of the marvellous intensity of light which these mantles produced. The exact proportion was found after many careful experiments to be 99 per cent. of thorium and 1 per cent. of cerium. It was still necessary to resort to further research before we could fully understand how it was that the incandescent mantle could produce light equal to 18 candles per cub. ft. of gas consumed; whereas when we used the gas in the ordinary way, in producing a flat or other flame we obtained only about 3 candles per cub. ft. of gas consumed.

The efficiency of the mantle at the first start with the "C" burner was equal to 15 candles per cub. ft. of gas consumed. It diminished with the age of the mantle. The incandescent "C" burner was

6 times as efficient as an ordinary gas burner.
5 ,, ,, ,, Argand do.
3 ,, ,, ,, regenerative do.

Notwithstanding the considerable improvement made in the mantles of late years, it was stated that to see incandescent gas lighting to perfection one needed to go to Berlin. In that city the mantles were used without any coating to protect them in transit, the burning off of which when first lighted caused a certain amount of deterioration and loss of incandescence. Mantles should not be kept in stock for any length of time, as they became deteriorated by the action of the oxygen in the air. By-pass burners should be used; the by-pass only consumed 1ft. per twenty-four hours.

FORMING GROUND FLOOR ON THE CENTERING.
The stirrups to be seen are in the main beams carrying the floor.

The convenience of being able to light and extinguish gas burners at any one point at a distance away, as with electric light, was well recognized, and the Pneumatic Gas Lighting Co. and others had invented apparatuses for this purpose.

Natural ventilation was much improved by the use of incandescent gas lighting, the heat of the burners not only causing a healthful circulation of the air, but materially assisting to remove the vitiated air in all cases where proper provision had been made for its escape: in which connection Mr. Tucker cited the experiments carried out in the Birmingham Museum and Art Gallery in 1902, and reported upon by Prof. Percy F. Frankland, of Birmingham University; these experiments showing that—

(*a*) in the absence of any artificial illumination, there was a slight increase in the percentage of carbonic acid in the air during the course of the day;

(*b*) with the electric arc lamp illumination, the increase in the percentage of carbonic acid was distinctly more marked; while

(*c*) with the incandescent gas illumination there was a distinct diminution in the percentage of carbonic acid in the air.

The explanation of this diminution was not far to seek, it being obviously due to the more efficient ventilation of the gallery caused by the greater draught of heated air through the ventilating shafts placed above

VIEW SHOWING BASEMENT FLOOR AND CENTERING FOR GROUND FLOOR.

FORMING BULKHEADS ADMITTING LIGHT TO BASEMENT.

the incandescent gas burners. The circumstance that the percentage of carbonic acid actually diminished during the use of the incandescent gas burners proved that the products of combustion, from which damage to the pictures might be apprehended, was completely carried off by the ventilation, so much promoted by the gas-burners.

In the opinion of Professor Frankland the incandescent gas installation in the Art Gallery was preferable to electric arc lamps, for although these lamps did not give rise to sulphur compounds they generated ozone and oxides of nitrogen, which were calculated to act prejudicially on pictures.

The Lucas Lamp

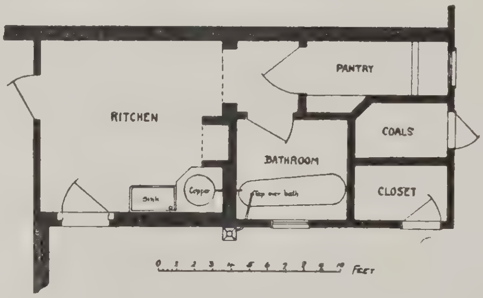
was a very good example of the latest type of incandescent gas lamp. Its special advantage was that it did not require any compressing plant or machinery to raise the pressure of the gas (as required by the usual type of high-pressure burner), each lamp being self-contained and constructed to work with the ordinary pressure of gas. The lamp was of simple construction, with no working parts to get out of order. It comprised a Bunsen burner of large diameter fitted with a special kind of regulating nipple for adjusting the supply of gas, a short glass chimney or globe, and an elongated metal cylinder or chimney. The proportion of gas and air burnt was about 5½ volumes of air to 1 of gas, this being the most powerful explosive mixture obtainable with coal-gas, and producing the highest possible flame temperature; 39 cub. ft. of this mixture consumed in the Lucas lamp per hour would produce an intensity of light equal to 200 standard candles. The lamps were made in four sizes, with consumptions of gas as follows:—

200 candle-power	6 cub. ft. of gas per hour.
400 ,, ,, ...	10 ,, ,,
700 ,, ,, ...	17½ ,, ,,
1000 ,, ,, ...	24 ,, ,,

The lamps could be lighted by a special by-pass arrangement enabling a series to be operated from a distance and switched on and off as rapidly and as easily as electric light. The essential principle of the lamp was the proportion and combination of the glass and metal cylinder above the mantle, and the enlarged Bunsen tube, through which all the air required for perfect combustion was drawn.

The Khoma Lamp.

This was an incandescent gas lamp on the regenerative principle, by which the gas was superheated in a chamber before it passed to the burner. The chamber for heating the gas was placed directly above the mantle, well within the heating zone. This ensured the thorough superheating of the gas, in which state it mixed better with the air in the Bunsen burner. By the heating of the gas the lamp developed from 20 to 25 per cent. more light, as complete combustion was more nearly obtained. No chimney was used, so that there was no obstruction of light and no breakages could occur. For outside use the lamp had a wind-proof shield in the form of a copper cylinder to protect the mantles during renewal or while the lamp was being cleaned. The consumption of gas was about 4 cub. ft. per hour per burner, producing 150-c.p. per burner. A lamp might be fitted with a cluster of burners, but four burners were equal to 600-c.p.



COTTAGES WITH BATHROOMS.

THE above plan of a back addition has been drawn out by Mr. W. H. Death, builder and decorator, of Ipswich, who proposes to register it. Several cottages have been built in accordance with it, and the tenants are much pleased with them. Mr. Death says he receives a rent of 6s. 9d. per week (clear of rates and taxes) for some with six rooms, half hall and bay window, and 5s. 3d. for others without hall and bay. He estimates the extra cost of building the bathroom (with bath, p.c. 35s.) from £6 10s. to £7 10s. He has built ten for the Ipswich and Suffolk Freehold Land Society and four for himself. There is a water tap fixed over the copper (supplied from the main), and the tap over the bath is connected to the copper by galvanized iron pipe with a back nut inside and outside the copper near the bottom; as the pipe is always full of water the fire does not harm it. The waste-pipe is taken through the wall and discharges over a gulley outside. The bath can be used for washing linen.

Correspondence.

Buttresses.

To the Editor of THE BUILDERS' JOURNAL.
LONDON, W.

SIR,—Referring to the correspondence on this subject which has appeared in your Journal, perhaps you will allow me to make a few observations, since it was the publication of my design that caused the discussion. Neither of the suppositions which your delightfully sarcastic correspondent suggests is the correct reason why the ingle-nook is shown "well shored up at the angles," although, I had, I consider, justifiable reasons for placing buttresses there. The ingle-nook was an addition (the fireplace originally being situated on the opposite wall), and in the detail drawings the walls were made considerably thinner than the main ones for the sake of economy, but through a mistake in the tracing they are shown about the same thickness. If I had been so very anxious to employ buttresses in the design without having any idea of their being of some constructive value, I might have placed them at the other angles of the house, and a few more in between as well! But where thin walls are used rendered with rough-cast to keep out the damp, these buttresses are useful as strengtheners at the angles when there are hipped roofs, and often elsewhere. Even though they do not always take a *direct* thrust, as, of course, was their original use in Gothic work, they at least add considerably to the strength of a building whose walls, either for economy or otherwise, are built thin, and surely it is not such a very "repulsive" method of giving this extra strength.

Too much strength, as you say, may be "bad art," but it is infinitely "better art" than too little. It is amusing to read your crushing remarks about the innocent buttress because it does not *absolutely* take a direct thrust, when in the modern steel-framed buildings—apparently the architecture of the future—the whole structure is a sham!

Some of our best architects occasionally adopt these buttresses in their country-house designs, *not* merely for the "pleasing effect" they give—as one would imply from your sweeping statements about "bad art," "not knowing what architecture is," and the like. If all buildings are to be condemned because they possess some ornamental feature which is not absolutely essential, then very few will bear inspection.

A buttress here and there is not going to do architecture much harm, even when they may be used for other reasons than to take a thrust from a vaulted roof. At any rate, their adoption is not so opposed to the principles of architecture as the modern very clever system of sticking stonework and terra-cotta on to a steel frame and carrying five and six storeys on (apparently) thin wooden tracery and plate-glass.

This system presents a real danger to our future architecture, whereas over-supporting and strengthening is hardly a very serious fault.—Yours truly, E. G. WALKER.

[The above letter reminds us of that Irish solicitor who said he would first bring evidence to prove his client did not steal the goods, and then, if that did not satisfy the magistrate, he would bring evidence to prove that if he did steal them, there was every excuse for his doing so. Moreover, our correspondent writes as though we had been eulogizing the American system of hanging stonework on to steel, and tries to add point to his argument by inferring something which we never inferred. But he cannot gainsay the fact that there has latterly been a mild fever for sticking on useless buttresses, and it was against that stupid practice that our remarks were directed. It seems we need to repeat that a buttress must not be confused with a pier.—ED. B.J.]

R.I.B.A.

Mr. Reginald Blomfield on Architectural Education.

A MEETING of the Royal Institute of British Architects was held on Monday evening, the chair being occupied by the president, Mr. John Belcher, A.R.A.

The decease of Mr. James Barnet, Fellow, of Sydney, N.S.W., and Mr. James Thomson, Fellow, of Glasgow, was announced.

Mr. Reginald Blomfield, A.R.A., then read a paper on "Architectural Education."

The author said that the subject of architectural education had long engaged the attention of all thoughtful architects. Notwithstanding the increasing tendency to develop school training, and the improvements that had been made in it, the pupilage system had, in the main, held the field. No successful attempt had been made to bring it into relation with the schools and to coördinate the various methods of training in use in the latter. It was highly important that a pupil, before entering an architect's office, should have gone through such preliminary training in the schools as would enable him to get his bearings in the office without waste of time. Hence they had to consider how the student should be started in his course of architectural training, what subjects he should study, and how they should be taught. To arrive at clear ideas on this matter it was necessary to define what was wanted in an architect.

Architecture is the art that translates construction into beautiful forms; the architect, therefore, must master the principles and methods of construction before he can translate them. His real technique consists of the mastery of building processes: these are the true vehicle for the expression of his imagination. Another highly important matter is the possibilities of new methods of construction. Steel and iron render possible feats of construction which, on economic grounds alone, are irresistible; and it is the architects' business, as artists of form, to study steel and ironwork in order to develop out of its practical use methods of construction which have a beauty of their own in their adaptation of means to ends. The architect's training ought to enable him to take this matter up where the engineer is compelled to leave it through want of training in form and lack of artistic imagination.

Dealing with the unsatisfactory condition of architectural education, the author summarized the chief defects of the present system of schools as (1) faults of syllabus, (2) faults of teaching method, and (3) the absence of coördination, resulting in waste of resources and loss of driving power. Two years ago some informal conferences of architects were held to discuss the situation; and finally, at the invitation of the Royal Institute of British Architects, a Board of Architectural Education was formed to consider the whole matter. The conclusions arrived at by the Board were embodied in a report which, together with a syllabus, had been provisionally adopted. Five points were dealt with, viz.:—(1) Preliminary education, (2) the length of proposed course, (3) the syllabus of training, (4) the laboratory or workshop for training in practical work, (5) the steps to be taken to initiate and administer the scheme.

As regards (1) preliminary education, it is a difficult matter to assess the exact amount of general education necessary to an intending student of architecture. A student may have great natural aptitude for architecture, but little aptitude or little opportunity of acquiring the knowledge usually given by a good general education. The Board consider it best not to impose any preliminary test for admission to the architectural course, but to leave it to the individual training institutions themselves to lay down the amount of preliminary education they severally consider desirable. The Board, however, consider that evidence should be shown of some capacity in drawing, both geometrical and freehand.

(2) For the length of the proposed course, the Board recommend four years as a minimum—the first two years to be spent in the schools, the last two in an architect's office. The object of this is twofold: first, to enable the student to master his rudiments in the schools in order that when he enters the architect's office he may know how to learn and get the full advantage of his opportunities in the office; secondly, that in view of the pupil being partially trained, architects may be disposed to take pupils at a lower premium, and parents and guardians may not be put to a greater expense than they are under the present pupilage system. The pupil should continue his studies in the schools during his term in an architect's office. The preliminary course must of necessity be rudimentary, and should be supplemented by more advanced studies under his old teachers during his last two years. His studies will thus be pursued on a consecutive system, and under competent supervision from first to last. It is suggested that on the completion of the course a certificate should be granted to the student in consideration of satisfactory progress and capacity as proved by his work in the schools, and by a study of some architectural project, to include working drawings and specifications, and an analytical account of the nature and intention of the project. This study would be on the lines of the thesis submitted for degrees in certain university courses. The certificate would be endorsed by the architect with whom the student had served his time.

(3) The first step towards standardizing the different systems of training would be the adoption by the schools of a common syllabus. The syllabus proposed by the Board rests on the general principle that construction is the basis of architecture, and the correlative principle that architecture is the interpretation of construction into forms of æsthetic value. In drawing up this syllabus the Board have been guided by the following considerations:—(1) That it should be thoroughly practical, stress being laid on the teaching of construction as the basis of architecture; (2) that it should not attempt too much, that is, should not overload the student with a vast array of subjects, but should cut down those subjects to the essential and irreducible minimum, and insist on the student obtaining a thorough mastery of the subject as far as he goes. The following is the syllabus proposed by the Board:—(1) Building materials; (2) construction, including (*a*) applied mechanics, strictly in practical relation to construction, and (*b*) the practical methods of the building trades; (3) architectural drawing, including working and freehand drawings, solid geometry, and measured drawings of historial examples of architecture; (4) geometrical projection and rudimentary perspective, this latter to be studied as an aid to the shaping and modelling of building, not as a means of elaborating architectural drawings; (5) design and the history of architecture as supplemental to and elucidatory of the study of construction. These subjects would be taught by class work in the schools and by demonstration in the laboratory or lecture theatre of practical work.

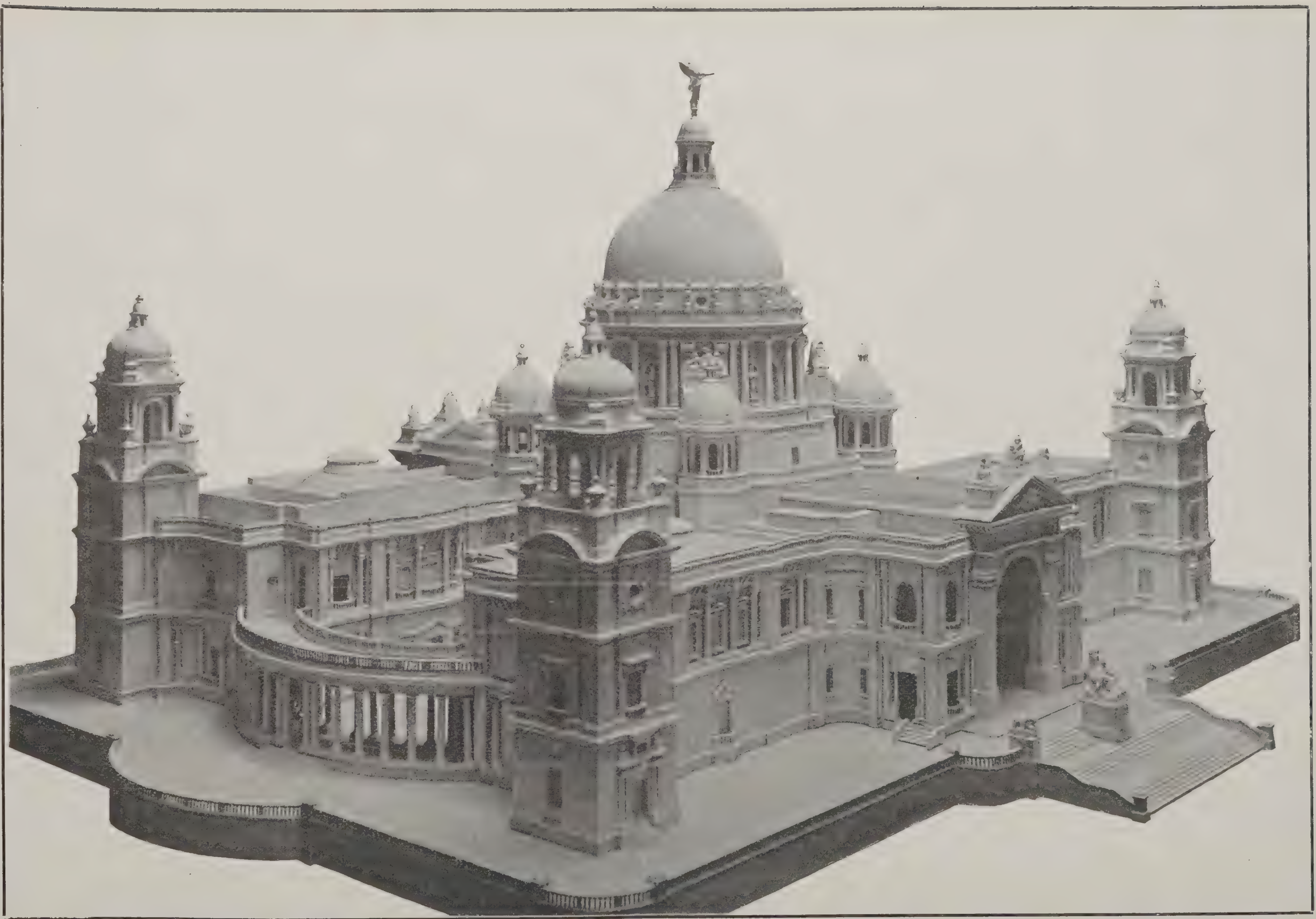
(4) The laboratory or workshop for training in practical work is an essential feature of the scheme. The demonstrations given in the laboratory would be in intimate relations with the lectures given in the classrooms of the schools, and the course would be arranged so that the training in the classrooms and in the workshops should proceed together. The author explained that there was no idea of using these workshops for the purpose of turning the student into a skilled plumber or mason, or whatever the trade may be. The object was to enable him to see with his own eyes, and if necessary handle with his own hands, the various materials and processes employed in order that when he had to direct these processes himself in after years he might have actual knowledge and realization of what he was doing. The author thought there was a little too much of the dilettante and the fine gentleman about the modern young architect; he would do better if he took off his elegant frock-coat and set to work in his shirt-sleeves.

(5) With regard to the steps to be taken to initiate and administer the scheme, these must to some extent be tentative at first. The scheme could only be got under way by the goodwill and co-operation of the various educational bodies concerned; and it was proposed to submit the scheme and its syllabus to recognized architectural training institutions, and to invite them to adopt it. Where engineering schools exist side by side with architectural schools, as in some of the modern universities, the student should avail himself as far as possible of the training there given; but, generally speaking, it was proposed to invite the county councils to place their technical workshops at the disposal of recognized training institutions for purposes of practical demonstration.

In concluding his summary of the proposals the author said that in recommending the adoption of a uniform system and syllabus the object the Board had in view was to reinforce education, to enlarge its opportunities by bringing the schools into touch with one another, so that, for example, their united resources might admit of lectures and demonstrations on a level beyond their attainment individually. The last thing the Board had in view was the establishment of a rigid and inelastic method of training; their aim was the co-operation of the schools in a scheme adopted by them all. It was proposed that the Board of Architectural Education should act as a central advisory body to the several schools, with power to direct the administration of the scheme by means of visitors, who would report to the Board on the work done in the schools. The future constitution of the Board had not yet been determined, but endeavour ought to be made to make it as representative as possible of the profession generally. It was for architects to put their house in order, to prove by visible evidence throughout the country that the practice of architecture is an affair of real skill and solid knowledge; that the architect from his point of view is an expert in building every bit as much as the engineer is from his. When the public realized that to spend their money on building to the best advantage they must go to the architect as the man who really knew his trade, they would readily accord them the recognition due to men of special knowledge and admitted ability in their own calling. The first step to this desirable end was to see to the training of their students, that they, at any rate, should master the technique of the great art of building. So should they prepare the way for the return of architecture to her rightful place as the mistress of the arts.

A discussion followed in which the following took part:—Sir Arthur Rücker, Principal of the University of London, Sir Aston Webb, Prof. F. M. Simpson, Messrs. H. H. Statham, T. G. Jackson, John Slater, Maurice B. Adams, E. M. Gibbs, G. A. T. Middleton, H. C. Corlette, H. G. Ibberson, E. Woodthorpe and John Belcher.

A new Leeds Church.—A new Church of the Holy Spirit is being erected on a site between Lodge Lane and Tempest Road, Leeds, from designs by Messrs. Prothero & Phillott, architects, of Cheltenham. The building is of stone and will accommodate 800; total estimated cost, £11,000.



MODEL OF THE QUEEN VICTORIA MEMORIAL, CALCUTTA. SIR WILLIAM EMERSON, F.R.I.B.A., ARCHITECT.

Photo: Bolak.

This model is made of wood (in about 40,000 pieces) with the exception of some of the smaller columns and figures, which are of brass. It is to ⅛in. scale and stands on a base measuring about 6ft. by 4ft. It is painted white to resemble the marble of which the monument will be entirely built. It has been constructed in London by a young model-maker named Mr. William Salter, who spent nearly a year on it. The cost has been between £400 and £500. Sir William Emerson had an audience of the King last week, when His Majesty expressed his approval of the work. The model is going out to Calcutta and will be used during the erection of the building.

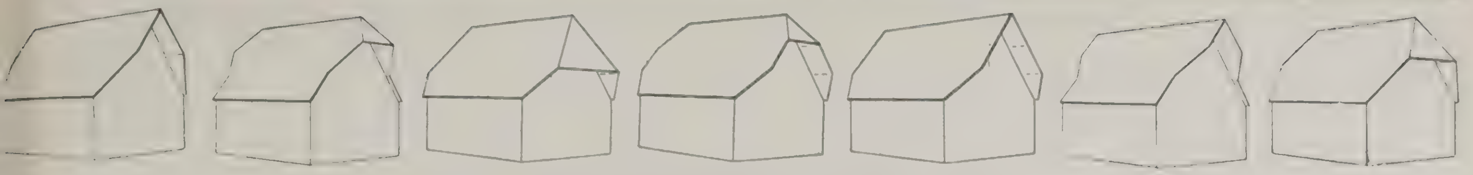


FIG. 2.—TYPES OF OVERHANGING GABLES IN FRANCE.

OVERHANGING GABLES IN FRANCE.

THE overhanging gable is frequently seen in Normandy, where it is a characteristic feature of local architecture. Fig. 1 shows a typical example, in which the projection of the roof serves to shelter from the weather the external staircase of a farm dwelling. In other cases the overhang is made to cover a stack of ladders, or it may be introduced merely for architectural effect. By varying the pitch of roof, the number of purlins, the amount of splay and of hipping, a great variety of form may be obtained, as suggested by Fig. 2. Fig. 3 shows the Normandy gable as applied to a villa, and Fig. 4 a dairy building in which it is combined with overhanging eaves, external purlins both at sides and end being supported on brackets. These are sketched from buildings in the south of France. In Normandy the roofs are slated and the splays are simply cut. In the south, where tiled roofs are general, the verges are finished with fascias of moulded tiles or of wood and zinc, as in Figs. 3 and 4.

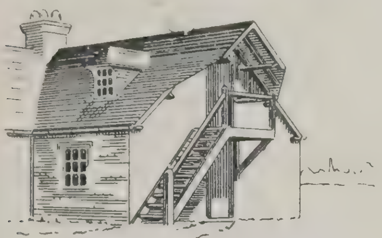


FIG. 1.—FARMHOUSE NEAR ROUEN.

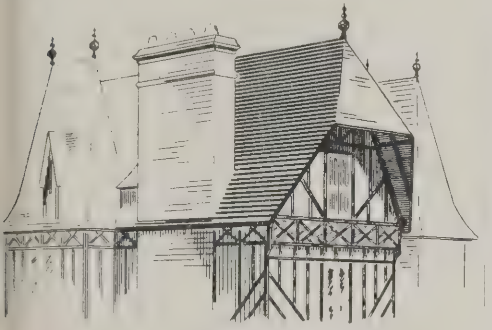


FIG. 3.—VILLA NORMANDE, CANNES.

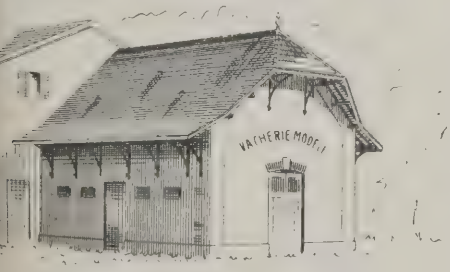


FIG. 4.—MODEL DAIRY AT ST. CASSIEN.

Such a form of roof I have never seen in England, but with modification to suit English materials it might be employed with advantage and effect to cover a bay-window balcony, to protect a hoist pulley or a bell, or for other purposes that will suggest themselves.

ALFRED T. BEST.

INSTITUTION OF CIVIL ENGINEERS.

AT the meeting of this Institution held on Tuesday last week papers were read on the Alfreton second tunnel by Mr. E. F. C. Trench, M.A., B.A.I., M.I.C.E., and on the reconstruction of Moncreiffe Tunnel by Mr. D. McLellan, M.I.C.E. The Alfreton second tunnel was undertaken in 1899 as part of the Midland Railway Co.'s scheme for widening their main line in Derbyshire. The new tunnel is 90ft. from the old and, like it, is half a mile long. It cuts through the coal measures, and several beds of coal were met with, from which fuel for the contractors' engines, &c., was obtained. Owing to the extensive cuttings required at both ends of the tunnel, it was not possible to attack it from the ends; five shafts were therefore sunk on the centre-line, and from these the whole of the tunnelling was done. The tunnel was driven of full size in both directions from each shaft, but when the working faces had approached to within 2 chains of each other, a small heading was driven through, in order that the alignment and levels might be checked. In no case was there any appreciable error, although the only instrument used for setting-out the centre-line was an ordinary 5in. transit theodolite. The tunnel is built of local red bricks and faced internally with best Staffordshire brindled bricks. The thickness of the tunnel ring is 2ft. 3ins., except for a few lengths in which it is 2ft. 7½ins., and the shaft lengths, which are 3ft. thick. Most of the tunnel was worked in lengths of 15ft., but at one point these had to be reduced to 12ft. owing to extra pressure on the timbering. A good deal of water was met with in driving the tunnel, and in order to drain this away from the working-faces earthenware pipes were laid below the invert. The permanent drainage of the tunnel is effected by means of a 2ft. brick culvert built on the invert. For turning the arch of this culvert, centering mounted on a trolley was used. This effected a considerable saving in time, and rendered it possible to build the culvert at the rate of 44 lin. yds. per day. The drainage of the shafts is effected by means of earthenwork pipes built in behind the brick-lining of the shafts and tunnel, and discharging into the tunnel at rail-level. The water which accumulates around the shaft-lining is collected and led to these pipes by means of brick "garlands" encircling the shaft-linings just below the water-bearing strata. The brickwork at the intersections of shafts and tunnel is wholly of blue bricks in cement, the arris being formed of special bricks made to the proper angles.

Special care was taken in designing and building the tunnel-fronts to avoid the failures which sometimes occur at these places. The face-wall was built to a batter of 1 in 6, and in order that the brick courses of the tunnel-ring might be brought in normally to this batter, the tunnel was given a bell-mouth, the vertical axis being increased in length by 2ft. at the face. To increase the longitudinal strength of the tunnel, hoop-iron straps were built between the brick courses at each face.

The time occupied in building the tunnel was nearly two years. The works were carried out at the direction of the company's engineer, the late Mr. J. A. McDonald, M.I.C.E., the contractors being Messrs. Thomas Oliver & Son, and Mr. Trench resident engineer.

At the Moncreiffe Tunnel, on the Caledonian Railway, near Perth, the work of reconstruction was carried on with the aid of four steel travelling shields 32ft. long, 22ft. wide and 16ft. 8ins. high with openings through them 13ft. 8ins. wide and 13ft. 6ins. high for the passage of trains.

Builders' Notes.

Messrs. Patman & Fotheringham, Ltd., are making good progress with the rebuilding of Baltic House, Leadenhall Street, E.C.—Mr. James F. Parker (managing director), Mr. L. Blake (director) and Mr. L. T. Williams (secretary) state that Mr. A. E. Parker, in bankruptcy, has not had any connection with, or interest in, the firm for some considerable time.

Measures Brothers, Ltd.—At the ordinary general meeting held last week, Mr. Robert H. Measures, who presided, moved the adoption of the report and the payment of a dividend on the ordinary shares of 3½ per cent. for the year. He observed that although the profit was not so good as that of previous years, the directors felt that there was much to be thankful for when the company's report was compared with those of other concerns doing a similar kind of business. During his forty years' experience he had never known such a trying period as that through which the company had passed in the past year. Owing to severe competition, orders had been very difficult to obtain, and even then they could only be got at the very smallest margin of profit. Nevertheless the company had held their own, and he was satisfied that when prices advanced, as they must do, there would be a return to the old rate of dividend. At the present time the company had sixty-seven competitors in London alone as compared with thirteen eight years ago. The German, French and Belgian mills had formed a syndicate in order to control the whole of the export from the three countries. An effort was now being made to effect an arrangement with the English mills, and if that were done competition would cease. The company dealt equally with English and with foreign joists. The latter could be obtained to stand higher tensile strain, and with better carrying power at a considerably lower price.—The motion was adopted.

Building By-laws Reform Association.—At the annual meeting held last Wednesday it was stated in the second annual report of the council that the by-laws committee of the Association had drawn up a new set of draft by-laws for rural districts which they thought omitted many of the objectionable regulations of the old methods. These draft by-laws were appended to the report, and the council hoped that they might be adopted in rural districts, or in the rural portions of urban districts, in substitution for the unnecessarily stringent by-laws already in force in those districts. The by-laws committee had not yet dealt with the very difficult question of the amendment of the present model by-laws for the urban districts, but they hoped to be able to take up this work during the present year. The council had felt that immediate alleviation of the grievances of which landowners, architects and builders complained could be given by the drafting of a Bill to exempt altogether certain buildings from the operation of by-laws other than those relating to sanitation. They had accordingly prepared a Bill to provide for the exemption in any district in which by-laws were in force of buildings which it was proposed to erect with a certain amount of open space around and held with them, and also to empower the Local Government Board to recall by-laws sanctioned by them which were found to be inapplicable to the districts in which they were in force. They believed that if the Bill were to become law it would tend to free the country from the grievance which was now so much felt.

Change of Address.—Mr. W. E. Farrer, engineer and sanitary specialist, has changed his London address from Queen Victoria Street to 39, Victoria Street, Westminster.

At the Taunton Municipal Buildings a new hot-water heating apparatus has been supplied and fixed by Messrs. Stanley Sheen & Co., heating engineers, of Sheffield, on their small-pipe safe-pressure system.

Dissolutions of Partnerships.—The following two dissolutions of partnerships are announced—between Messrs. J. Simpson, W. Allen and T. Rose, carrying on business as The Barnacle Hall Brick and Tile Co., near Coventry; and between Messrs. W. Thornley, T. Thornley, C. Butler and A. Waterworth, carrying on business as builders at Weaste under the style of William Thornley & Co.

At the recent Exhibition of School Appliances at South Kensington held in connection with the conference on school hygiene instituted by the Royal Sanitary Institute, Messrs. Adamsez, Ltd., secured the only bronze medal awarded for school sanitary fittings, for their Fig. 115 T. urinals, which are being so largely adopted in all schools throughout the country and in considerable numbers by the War Office authorities at Bordon Camp, Chelsea Barracks, Shorncliffe Camp, &c. Messrs. Adamsez also exhibited their glazed ware division slabs, seat-action pneumatic closet set and Fig. 773 school lavatories, as well as "Adamesk" art pottery.

PETITIONS AGAINST THE L.B.A. AMENDMENT BILL.

THE following petitions have been presented against the London Building Acts Amendment Bill, promoted by the London County Council:—

London Boroughs: Stepney, Paddington, Wandsworth, Hammersmith, Hampstead, Bethnal Green, Holborn, Hackney, Camberwell, Westminster, Stoke Newington, Fulham, Woolwich, Shoreditch, Kensington, Lambeth, St. Pancras and Islington.

City Companies: Ironmongers, Merchant Taylors, Haberdashers, Salters, Skinners, Goldsmiths, Mercers, Fishmongers, Vintners, Grocers and Clothworkers.

Professional Bodies: Institute of Civil Engineers, Royal Institute of British Architects, District Surveyors' Association, Auctioneers' Institute, Surveyors' Institution, Institute of Builders, Institution of Electrical Engineers.

Public Bodies, Companies and Londoners: London and India Docks Co., the Duke of Westminster, the Ecclesiastical Commissioners, Lord Llangattock, Mr. Edward Yates, the Bridewell and Bethlem Hospital, the Improved Industrial Dwellings Co., the Surrey Commercial Docks Co., the Westminster Electric Supply Corporations, Association for the Protection of Property Owners, Metropolitan Water Board, the London Chamber of Commerce, the Hon. Societies of Lincoln's Inn, Inner Temple and Middle Temple, the Stock Exchange, the railway companies owning lands in London, the Gordon Hotels, companies supplying electrical energy in London, general storekeepers and drapers, the Gas Light and Coke, South Metropolitan and Commercial Gas Cos., Messrs. N. M. Rothschild & Sons and other banking houses, the National Telephone Co., the Wharfingers' Association, associated owners of City properties, associated landowners and others.

There are eight petitions against the Bill which is being promoted by the Corporation. These are from the London County Council; the Great Eastern, Metropolitan, Metropolitan District and North London Railway Cos.; the Hon. Societies of the Inner Temple and Middle Temple; and the London and India Docks Co.

Keystones.

To complete the Repair and Restoration of Chichester Cathedral a further sum of £5,000 is required. The money already subscribed has been expended without the bell tower (which is to be completely restored) and the roof being touched.

The Palais Royal, Paris, is to be radically altered by an American syndicate. Shops, restaurants and even the historic theatre are to disappear, and in their place will arise a new spacious theatre and a sky-scraping hotel, while the shops will be run on American lines.

Battle Bridge; King's Cross.—Here is a dreadful instance of a wrong change in street names—from Battle Bridge, where Boadicea fought the Romans, to King's Cross, which took its name from the worst statue on record—of George IV.—("Daily Chronicle.")

For a new Infirmary at Alnwick the design of Mr. J. Wightman Douglas, architect, of Newcastle and Alnwick, has been selected in competition, this having been awarded the first premium of £100 by Mr. Frank Caws, of Sunderland, the assessor. Twenty designs were submitted.

The Wallasey Public Offices Competition has been decided as follows:—First premium (£250), Messrs. Briggs, Wolstenholme & Thornely, of Liverpool; second (£75), Mr. A. R. Jemmett & G. T. M'Combie, of London; third (£50), Mr. W. H. Ashford, of Birmingham. Ninety-six designs were submitted, Sir William Emerson being the assessor.

Northumberland War Memorial.—Mr. T. Eyre Macklin, R.B.A., of Newcastle, has been selected for this memorial. Mr. Thornycroft, R.A., was the assessor. There were forty-one competitors. Mr. Macklin will receive one hundred guineas for his services in connection with the preparation of the model, &c., and the erection of the memorial, a site for which has been provided at Barras Bridge, Newcastle. The total cost will be £2,000.

Society of British Sculptors. — At the statutory general meeting held last week Mr. Thomas Brock, R.A., was elected president, Sir C. Lawes-Wittewronge treasurer, Mr. Percy Edsall secretary; council: Mr. Drury, Mr. Frampton, Mr. W. S. Frith, Mr. F. Lynn Jenkins, Mr. W. Goscombe John, Sir Charles Lawes-Wittewronge, Mr. T. Stirling Lee, Mr. D. McGill, Mr. Pomeroy, Mr. Reynolds-Stephens, Mr. Hamo Thornycroft and Mr. F. Derwent Wood.

Mr. Edward S. Prior, M.A., presented the prizes to students of the Birmingham Municipal School of Art last Wednesday. He delivered an address in the course of which he spoke of the erection of a cathedral in Birmingham. Why should it not be for them to create, to build it, decorate it, and fit it as a church of this century? If built by them as architect-masons and architect-carpenters, if sculptured by them as craft sculptors, if decorated by them as craft painters, smiths, glaziers and tilemakers, the cathedral would be, as were the ancient cathedrals, a growth from the art life of to-day which the city of Birmingham was so strenuous in maintaining. What mimicking copy could be half as fine a thing as that?

Edinburgh Architectural Association.—At last Wednesday's meeting of this Association the Rev. Professor Cooper, of Glasgow University, read a paper on "A minister's thoughts in regard to the arrangement and furnishing of a Scottish parish church," in the course of which he praised a committee for the building of a new church in a northern town who had told the selected architect that what they chiefly wanted was a fine interior. That showed a great advance upon the time, not long past, when it was outside elegance only that was thought of. He proceeded to denounce side galleries and sloping floors, and said that the worst place possible for the organ was the chancel. He recommended a return to the pulpit canopy; advised that the chancel should not be too deep, yet spacious and unencumbered; and concluded by expressing the hope that the Scottish universities would soon, like Manchester and Liverpool, be supplied with Chairs of Architecture.

Obituary.

Mr. Daniel Wilkinson, builder, of Southport, died on Wednesday last, aged 62.

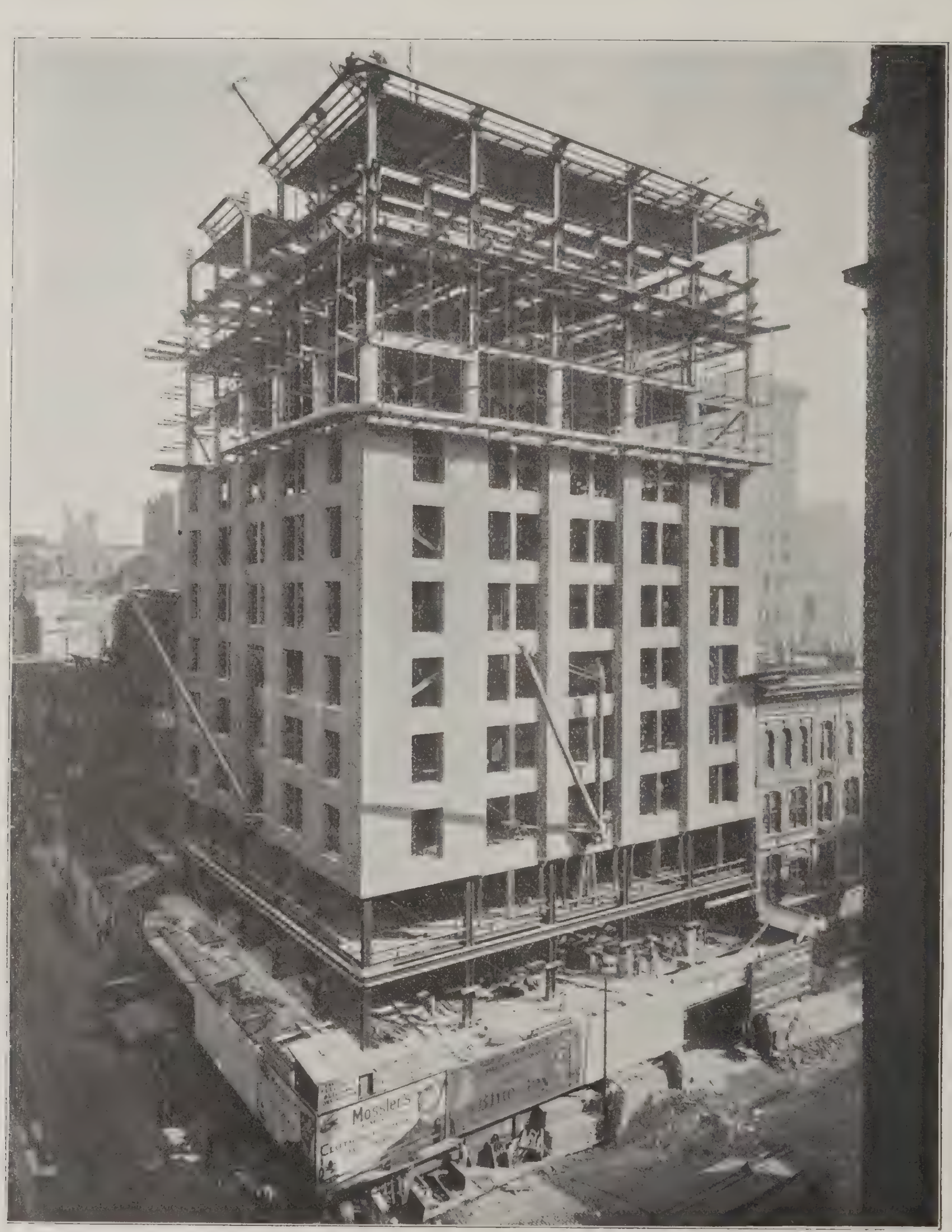
Mr. R. S. Davenhill, a director of Messrs. Hinton, Perry & Davenhill, Ltd., roofing tile manufacturers, Pensnett, died recently, aged 38. For eleven years he was with Mr. Henry Lovatt, of Wolverhampton, and for seven with Messrs. S. Pearson & Son, of London. For the latter he carried out the big tunnel on the new South Wales direct line. This was a difficult task, and resulted in the breakdown of his health and the resignation of his position with Messrs. Pearson.

Mr. Oswald E. Prest, of the firm of Messrs. E. J. Prest & Co., artists in stained glass, died recently at the early age of 22. He was a promising young artist and designer, a successful student at the Camden School of Art and the Central School of Art and Handicraft, Regent Street, an exhibitor at the Royal Academy, and a successful competitor in the "Studio" competitions, obtaining a first prize as recently as December last. He had spent the autumn in the neighbourhood of Penzance, hoping to benefit by the open-air life in landscape painting, to which he turned with great facility, but was compelled to return home owing to increased weakness, and he died of consumption on February 8th.

Mr. James Thomson, F.R.I.B.A., I.A., of the firm of Messrs. John Baird & James Thomson, architects, Glasgow, died on February 12th. Mr. Thomson acted as architect in connection with many of the larger buildings in Glasgow, including those of the Standard Assurance Co. in Gordon Street; the Lancashire Insurance Co. and the Liverpool, London and Globe Insurance Co. in Hope Street; and the Scottish Union and National Insurance Co. in West George Street; as well as several buildings in Glasgow and throughout Scotland for the Clydesdale Bank and the British Linen Co. Bank. He was also architect for the Shaw Convalescent Home at Bearsden, the Royal Asylum for the Blind in Castle Street, Glasgow, and for the Dumbarton Municipal Buildings. Among the numerous mansion-houses erected from his designs are Belmont Castle (the seat of Sir Henry Campbell-Bannerman); Orie House, Aberdeenshire; Birkwood House, Lesmahagow; Kinnaird House, Stirlingshire; and Gartshore House (for Mr. Alex. Whitelaw, M.P.). Mr. Thomson's services were also much in request in connection with the valuation of property and in property arbitrations. He was twice president of the Glasgow Institute of Architects, and some years ago acted in a similar capacity in the architectural section of the Philosophical Society.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

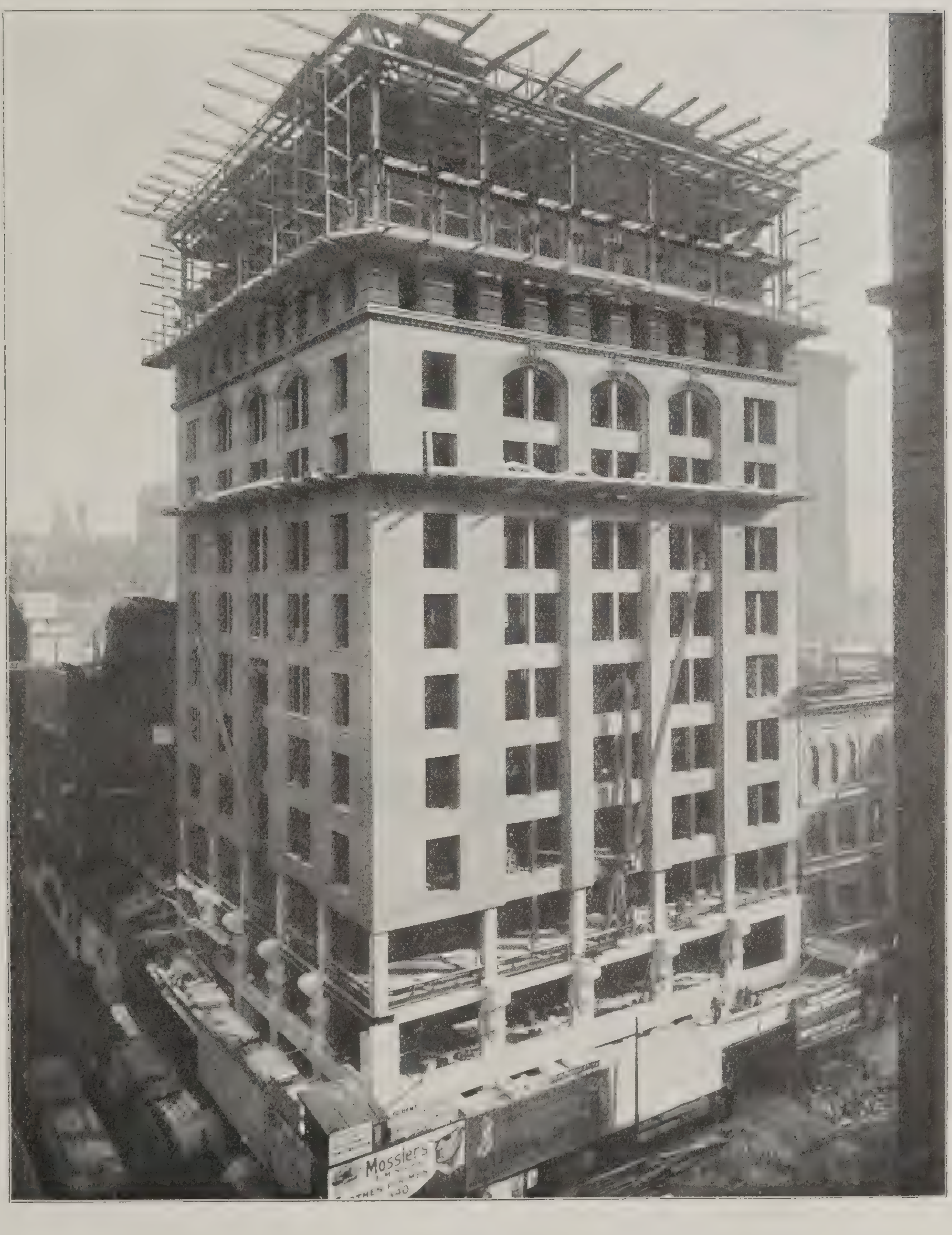
Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, February 22nd, 1905.



Photograph taken on October 16th, 1904, showing brickwork commenced at third storey and fireproofing of columns and floors, independent of brick enclosure.

THE RECTOR BUILDING, CH

Supplement to
The Builders' Journal and Architectural Record,
Wednesday, February 22nd, 1905.



Photograph taken on November 1st, 1904, showing the amount of work done in sixteen days.

rvis Hunt, Architect.

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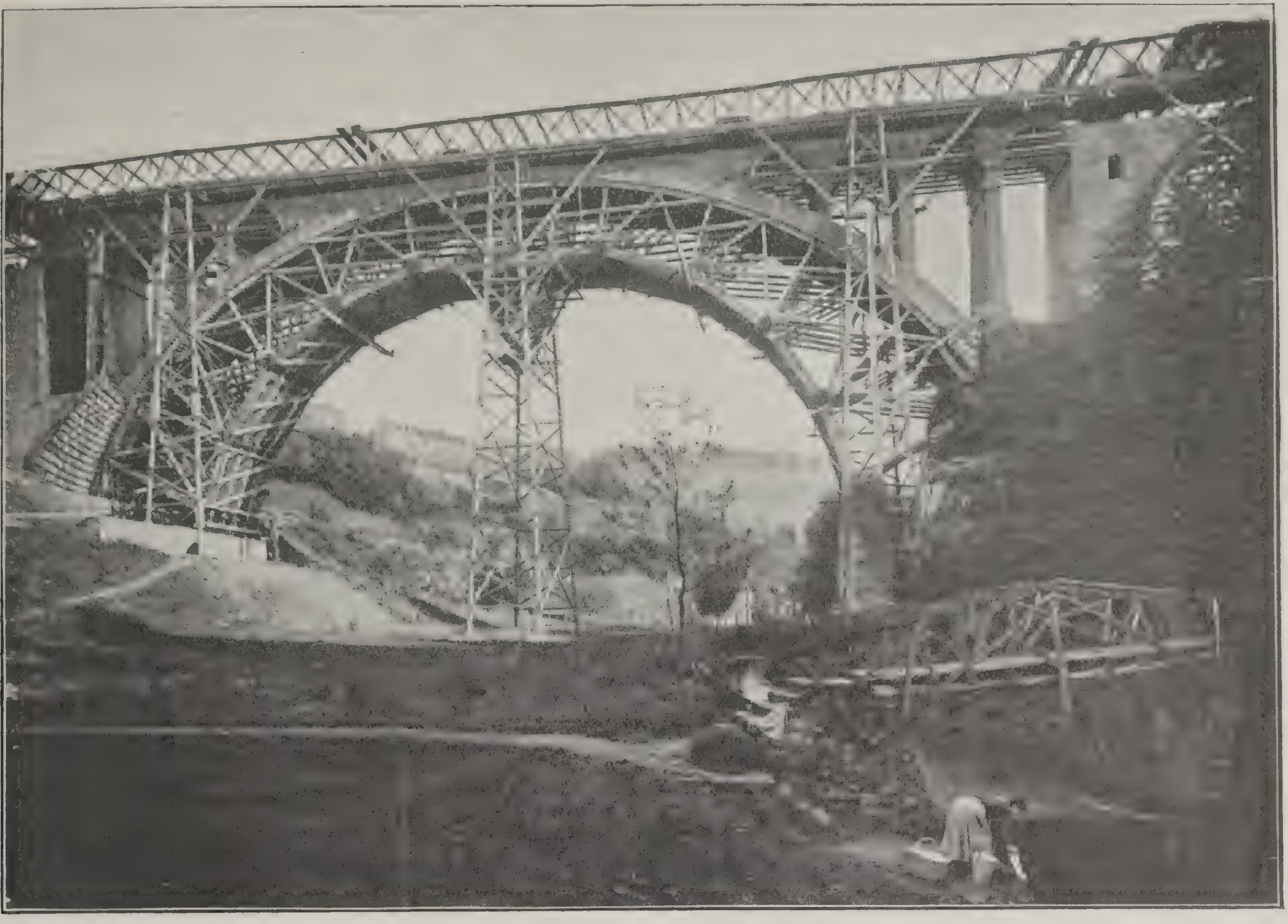


NEW BRIDGE AT LUXEMBURG, IN COURSE OF CONSTRUCTION.

NEW BRIDGE AT LUXEMBURG.

We are able to publish this week a photograph showing the remarkable centering used in the construction of this bridge, with its large stone arch, a view of which, as completed, was given on p. 93 of our issue for last week. The photograph speaks for itself and needs no comment on our part.

M. RODIN ON ARCHITECTURE.

In the February issue of the "North American Review" there is an interesting article by M. Auguste Rodin on "The Gothic in the Cathedrals and Churches of France," from which the following extracts are taken:—

No architect or sculptor has ever been able properly to restore a Gothic church or cathedral . . . The Italians, it is true, continue to repair their ancient monuments; but they only touch the parts that are falling to ruin; whereas when we repair we insist on restoring, and spoil the old in order to harmonize it with the new. . . . Our French cathedrals are superior to the English and German ones by the greater sculptural expression displayed in them. In this respect they are second to nothing outside antique Greek architecture. The German Gothic is characteristically hard. The cathedrals at Strasburg and Cologne exhibit this defect, but, like that at Milan, more on the exterior than in the interior. The interior of the Cologne edifice is very fine, and yet the structure as a whole does not possess that supreme art for lack of which the largest cathedral appears smaller than a small church which has it. Antwerp cathedral is very beautiful, more beautiful than Cologne. . . .

In one direction the Gothic sculptors surpass the Greek. The Greek temple is the same everywhere, and similarity, identity, is not a culminating quality of art. Life is made up of strength and grace most variously mingled, and the Gothic gives us this. . . . The study of Gothic has unquestionably influenced my sculpture, giving me more flexibility, more depth, more life in my modelling. . . . In order to reform our present stereotyped methods of art we want a second Renascence. For a long time I hoped that in a near future this might be; but I have ceased hoping to-day. It would require a catastrophe capable of overturning and changing everything. Of course, I am speaking of what is likely to happen in the next twenty-five or fifty years. Life is eternal; and, sooner or later, things must alter for the better. But, so far, in our modern architecture I see nothing that gives encouragement.

We have intelligent men who are sufficiently educated. They copy everything; they ferret out the style of Nineveh, as well as the styles of Louis XIV. and Louis XV.; but what they produce is without soul, without art and is insignificant. They repeat, but only as the parrot does. For long years we have done nothing but turn out from our colleges young men stuffed with useless scientific lumber; and they very quickly lose it all, and there is nothing to take its place.

OUR PLATES.

The two photographs of the Rector Building, Chicago, in course of erection, are interesting as showing a typical example of the large steel-frame buildings of the United States and the expedition with which American contractors proceed with their work. The huge cranes supported from the floors and the absence of scaffolding are particularly noteworthy. We are indebted to the American "Fireproof Magazine" for our illustrations.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Architectural Training.

Redhill.—Scholar writes: "Do you consider it would be beneficial for an architectural student to take a two years' course of study at the Royal College of Art, South Kensington, under a National scholarship, after having served about five years in an architect's office and studying at the local school of art? Do you think it would be better than continuing in an office and working at a small school?"

Yes, we think it would be better for him to attend the architectural school at South Kensington.

Buildings to Measure near Lowestoft; Architectural Lending Library.

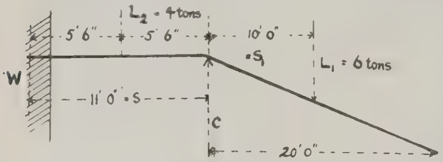
Highgate.—Student writes: "(1) Please name some buildings worth measuring near Lowestoft. (2) Is there an architectural lending library in London; if so, from whom can I obtain particulars?"

(1) Churches at Lowestoft, Beccles, Barsham, Haddiscoe, Loddon and Chedgrave would prove good specimens for your purpose. (2) If you are a probationer of the R.I.B.A. you can borrow books from the library and can obtain full particulars thereof from the secretary R.I.B.A., 9, Conduit Street, W. Failing this, the only other course open to

you is to join the Architectural Association, which has a library of its own—particulars of the secretary, Architectural Association, 18, Tufton Street, Westminster, S.W. M.

Gallery Cantilever.

LONDON, E.—Mr. F. W. JENNINGS writes: "The accompanying illustration is a solution



of this problem, which leaves no doubt as to its accuracy. To simplify the matters L_1 is taken as acting at its centre of gravity and L_2 central between supports. To find the reactions, we have for equilibrium—

$$CS - L_2\frac{S}{2} - L_1(S + S_1) = 0$$

$$- WS + L_2\frac{S}{2} - L_1S_1 = 0.$$

Solving, we get—

$$C = L_1 + \frac{L_2}{2} + \frac{L_1S_1}{S};$$

$$W = \frac{L_2}{2} - \frac{L_1S_1}{S};$$

or $C = 6 + \frac{4}{2} + \frac{6 \times 10}{11} = 13{\cdot}45$ load on column,

$W = \frac{4}{2} - \frac{6 \times 10}{11} = -3{\cdot}45$ anchorage required."

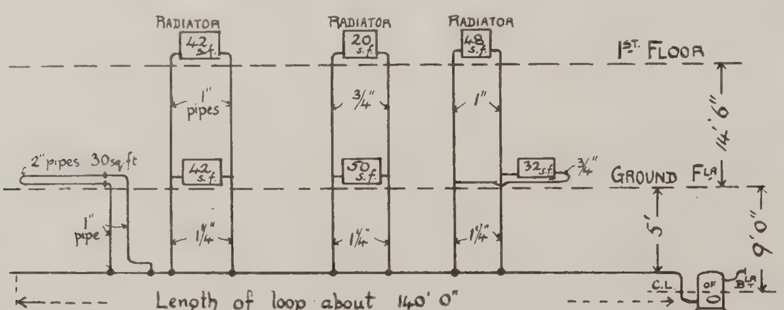
"Tarmac."

Referring to the enquiry and reply on p. 65 of our issue for February 1st, Mr. S Doddimeade Edmunds, M.S.A., writes: "Your correspondent will get all information of this material, also price laid complete, from Mr. Vernon Parker (Tarmac Department), of 20, Victoria Street, London, S.W., who is the London agent for "Tarmac.'"

Hot-Water Installation.

BEDFORD PARK.—HOT WATER writes: "I should be glad to have a good general practical formula for calculating the size of main pipes in a low-pressure hot-water heating installation, and its application to the case shown by the accompanying illustration. It would appear to me to depend mostly upon the radiating surface and its average height above the source of heat."

The size of the pipes is decided by the area of heat-yielding surface they feed, and the weight of water the surface contains. A good general practical formula, and one that will not degenerate into a clumsy and inaccurate rule-of-thumb, is to divide by 100 the area of heating surface in square feet, the quotient being the area of the pipe in square inches; or conversely, to multiply the square inches area of the pipe by 100, the result being square feet of heating surface. Thus, the area of a pipe 1in. bore is 0·78 sq. ins., and it will feed 78 sq. ft. of heat-yielding surface, though many would say only 75. If you check this rule by adding to the area thus found the weight of water enclosed by the heating surface (you may use gallons if you like, but weight in lbs. is better) and proportion the pipe to this total, you will be safe. To make sure of the current not reversing, and to aid the speed of flow, the last few feet of the return should be a size larger, when the extra weight of cool water will send the current quicker in the right direction. The driving power is the greater weight of the cooled water; it is connected with the proportion of heat-yielding surface to weight of water and its height above the heat-receiving surface. The loop main is probably of cast-iron with funnel elbows put face and tail to the current at the rise and drop pipes; and in settling its size the area of the outside of the funnel must be reckoned, and not that of its pipe. The main cannot practically be less than 3ins., with a 3in. flow-socket, and the return drop at the boiler side can be 4ins. with a 3in. socket. It is the coldness of the return water that drives the flow, and the extra size is to give the water more exposure and time to cool. If the boiler be "independent," a screen between it and the down pipe will catch the radiation from the boiler side and keep the pipe cooler. O. WHEELER.



HOT-WATER INSTALLATION

The National Competition.

GLASGOW.—G. M. S. writes: "Are Scottish students still at liberty to send up architectural works for the National Competition, as now no works of Scottish students are sent up by the various schools of art, which are at present under the control of the Scotch Education Department? Is it allowable for individual students to compete?"

Paragraph 18, form C. 363, issued by the Scotch Education Department, states that "in all cases where works from schools in Scotland are to be entered for this competition notice should in the first place be given to this department not later than March 1st. No payment will be made as formerly on the works so entered, but they will be eligible for the award of prizes in the competition. It is specially requested that managers and teachers will take particular note of the fact that only such works should be selected and sent forward to the Board of Education, South Kensington, as appear likely to have a reasonable chance of gaining awards at the National Competition. Candidates submitting art works for the art class teacher's or the art master's certificates must forward them through the managers of the classes with which they are connected, in the same manner as works for the National Competition. Full detailed instructions will be found in form 564 issued by the Board of Education."

Queen-Post Roof-Truss.

SHEFFIELD.—PERPLEXED writes: "How can I obtain the stress diagram of a queen-post roof-truss?"

The stress diagram for vertical loads on a queen-post roof-truss is easily found by the usual methods, which are dealt with in most books on building construction or stresses; for instance, Allen's "Building Construction" and Middleton's "Stresses and Thrusts." When we come to work out a diagram for the wind loads it is at once seen that a queen-post truss requires braces in the centre panel. If they are omitted in practice the members and joints have to be strengthened to make up for the omission.

Office of Works.

NORTHAMPTON.—J. C. H. writes: "Where can I get particulars of the appointments for architectural assistants in the Office of Works, and where can the examination papers be obtained?"

We have answered this question over and over again—most recently in our issues for April 6th, April 20th and July 13th, 1904 If you refer to those issues you will find all the information you desire.

Setting-out Curves by means of Ordinates.

PLUMSTEAD.—P. A. S. I. writes: "The following formula for setting-out curves by means of ordinates appears on p. 243 of Usill's 'Practical Surveying,' 7th edition:—

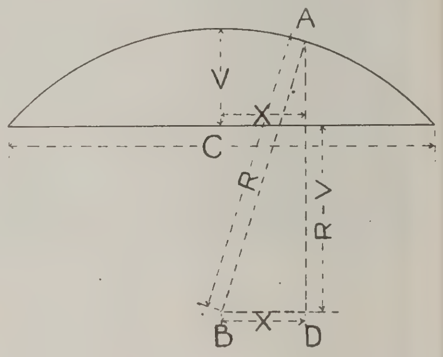
$$O = \sqrt{R^2} - X^2 - (R - V).$$

Is this correct? I do not think it is. I have arrived at the conclusion that it should be

$$O = \sqrt{R^2 - X^2} - (R - V).$$

Am I right or not?"

You are obviously correct, as shown by the diagram below, when C = the chord,



V = the versed sine, R = the radius of the curve, X = the distance of ordinate from centre of chord, and O = the length of the ordinate. Then in the triangle ABD, AB represents the radius, BD = X and AD = O + (R – V); and as it is a right-angled triangle –

$$AB^2 = BD^2 + AD^2.$$
$$\therefore\ R^2 = X^2 + \{O + (R - V)\}^2.$$
$$\therefore\ \{O + (R - V)\}^2 = R^2 - X^2.$$
$$\therefore\ O + (R - V) = \sqrt{R^2 - X^2}.$$
$$\therefore\ O = \sqrt{R^2 - X^2} - (R - V).$$

G. A. T. M.

Cheap Blackboard.

LIVERPOOL.—T. E. M. writes: "Which is the cheapest form of home-made blackboard either of wood or cardboard?"

Framed deal is the best for the purpose. As regards colouring a blackboard the following is a recipe:—Dilute liquid soda silicate (water glass) with its own bulk of water and add just enough lampblack to colour it.

Architectural Fitment of Ships.

SUNDERLAND.—G. H. S. writes: "I am a shipjoiner; I hold first-class elementary and first-class advance certificates in building construction; I also gained a 15s. book prize for architectural drawings in the National Competition. I am acting as setter-out at Sir James Laing & Sons, Ltd., Sunderland. What course should I pursue to become a designer of ship-saloons, music-rooms, smoke-rooms, &c., somewhat like those published by you on April 10th, 1901?"

You should attend courses in design and cabinet work and read books on art subjects generally. Then try to get in the office of a firm doing this class of work, though we may say it is confined to a few firms only.

Trade and Craft.

The Surface of Floors.

If imitation is the sincerest form of flattery, the Euboeolith Patent Flooring Co. may well take heart from the fact that several imitators of their system of flooring have appeared on the English market. Time is the only test of a flooring, and as Euboeolith has stood the test of many years it need have nothing to fear from the systems of flooring now making their appearance. Close on 600,000 yds. of Euboeolith have been laid by this company, and they have several large orders in hand.

The flooring is suitable for all kinds of buildings; in fact, it is difficult to say if there is a class of building for which it is not suitable. At the present time it is in use in churches, mission rooms, palaces, mansions, hospitals, infirmaries, operating theatres, schools, houses, clubs, barracks, waiting-rooms, municipal buildings, offices, shops, mills and factories.

The materials used in the composition are secret. It is laid in a plastic condition on to the rough concrete bed, or it can be laid on a flagged or tiled floor, or upon any firmly nailed wooden floor. Its adhesion to any of these is perfect. It has a thoroughly jointless surface, which can, if desired, be highly polished. The flooring is rapidly laid and can be used soon after it has been put down, although it is advisable to allow a fair time for setting, as floors of this description get marked if used too soon after finishing off. It is advisable for a floor in a new building to be laid when practically all other trades have finished.

So waterproof and non-absorbent is it that a room covered with the material and with a coved skirting carried 3ins. or 6ins. up the walls could if desired be flushed with a hose pipe. Euboeolith possesses also the additional advantages of being fire-resisting, jointless, noiseless, agreeable to walk upon, and of being able to stand heavy and rough traffic. It can be laid in several colours, and the colours are permanent, going through the entire thickness of the material. When laid Euboeolith strongly resembles cork carpet, and being warm the extra expense of carpet is saved. It is supplied by Mr. J. Percy Day, of 3, Victoria Street, Westminster.

Coming Events.

Wednesday, February 22.

Royal Sanitary Institute. — Inspection and Demonstration at Islington by Mr. James R. Leggatt, Supt., Public Health Dept., Islington, at 2 p.m.

Edinburgh Architectural Association.—Mr. Charles E. Elcock on "Through York with a Camera," at 8 p.m.

London Master-Builders' Association. — Annual Dinner and Presentation to Mr. J. Howard Colls, Trocadero, at 6.30 p.m.

Thursday, February 23.

King's College Architectural Society.—Mr. Ronald P. Jones, M.A., on "Saracenic Architecture in Cairo," at 5.30 p.m.

Leeds and Yorkshire Architectural Society. —Mr. Maurice B. Adams, F.R.I.B.A., on "More about Modern Libraries," at 6.30 p.m.

Royal Academy.—Professor Aitchison, R.A., on "Vitruvius," at 4 p.m.

Carpenters' Company.—The Rev. W. Marshall on "Our Old Parish Churches," Carpenters' Hall, at 8 p.m.

Friday, February 24.

Glasgow Technical College Architectural Craftsmen's Society. — Mr. Colin Sinclair on "Steel Construction," at 8 p.m.

Architectural Association.—Mr. F. J. Osborne Smith, A.R.I.B.A., on "Country Houses and Accessory Buildings," at 7.30 p.m.

Institution of Civil Engineers. (Students' meeting).—Mr. F. D. Flint on "Morecambe Sewerage: Method of laying a 15in. Cast-iron Sewer under the London and North-Western Railway," and Mr. H. M. Rootham on "The Reconstruction of Bow Bridge over the River Lea," at 8 p.m.

University College.—Mr. D. S. MacColl on "Dyce and Watts: Attempts to Revive Mural Painting," at 4.30 p.m.

Saturday, February 25.

Royal Sanitary Institute. — Inspection and Demonstration at the Battersea Disinfecting Station, Mortuary and Shelter, by Dr. G. F. McCleary, at 2.15 p.m.

Builders' Foremen's Association.—Mr. F. M. H. Joneson "Slag-wool," Memorial Hall, Farringdon Street, E.C.

Architectural Association.—Third Spring Visit to New Sessions House, Old Bailey, at 2 p.m., and Coutts's Bank, Strand, at 4 p.m.

Royal Institution.—Mr. D. G. Hogarth on "Archæology," at 3 p.m.

Monday, February 27.

Surveyors' Institution.—Meeting at 8 p.m

Liverpool Architectural Society. — Rev T. W. M. Lund on "The Classical Architecture and Sculpture of Rome," at 8.45 p.m.

Tuesday, February 28.

Northern Architectural Association. — Mr. W. H. Wood on "The Design and Construction of the Spire of Newcastle Cathedral," at 7.30 p.m.

Architectural Association of Ireland. Paper by Mr. Frederick G. Hicks, at 8 p.m.

Wednesday, March 1.

Royal Sanitary Institute. — Inspection and Demonstration at St. Pancras, conducted by Mr W. G. Auger, sanitary inspector, at 3 p.m.

Surveyors' Institution.—Annual dinner, Hotel Great Central, at 7 p.m.

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Rainhill Red Sandstone Co., Ltd., Rainhill Quarries, Prescot, Lancs. Capital: £6,000.

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Wood Brothers' Glass Co., Ltd., Borough Flint Glass Works, Pontefract Road, Barnsley. Capital: £50,000.

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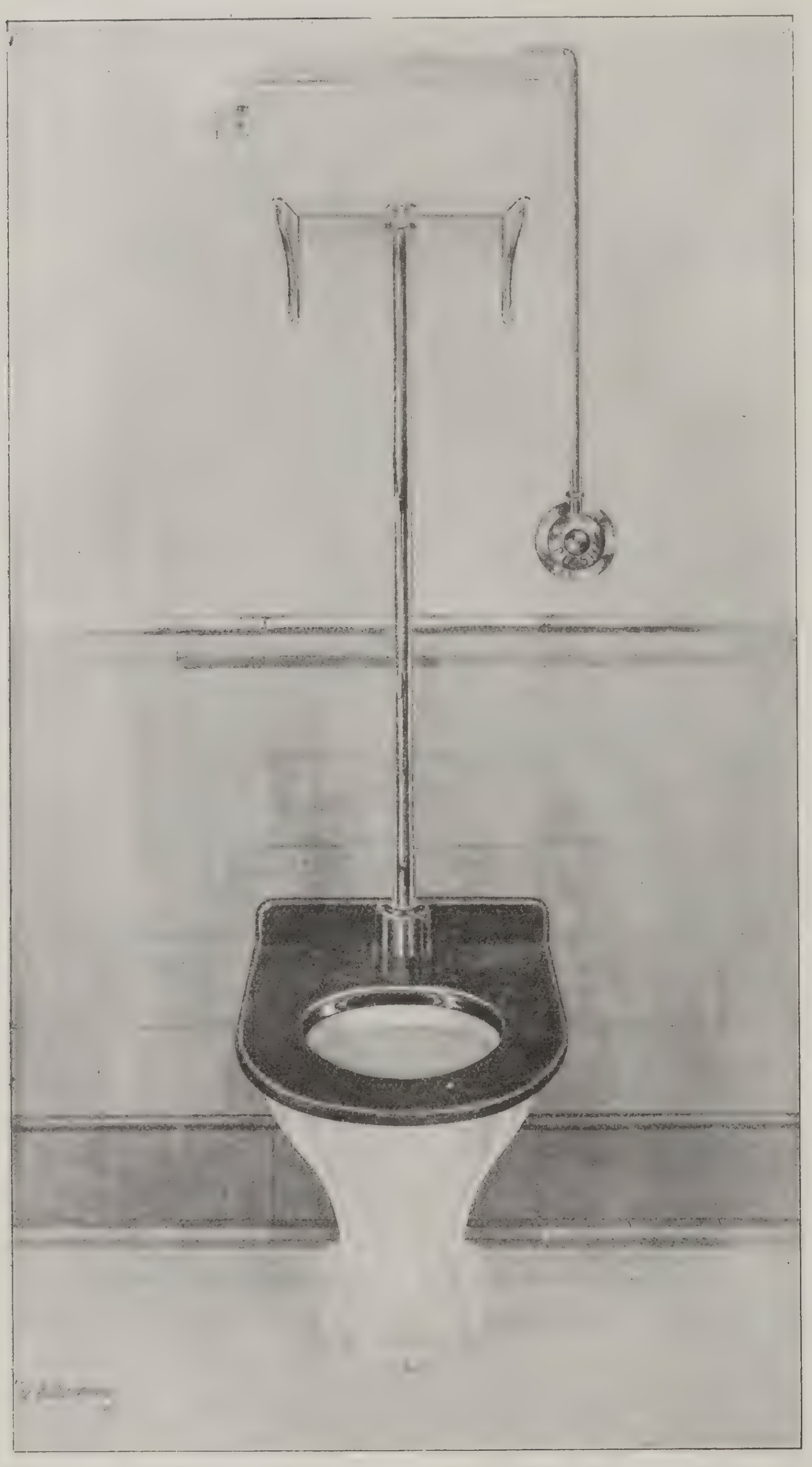

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DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		BUILDING:		
Feb.	23	Belgrave, Leicester—House, &c.	Sewage Works and Farms Committee.	E. G. Mawbey, Town Hall, Leicester.
,,	23	Buckie, N.B.—Store	—	Office of Mill, Buckie, N.B.
,,	23	Cork—Shed, &c.	Guardians	Boardroom, Workhouse, Cork.
,,	23	Glasgow—Extension of Workshops	Corporation	D. M'Coll, 38 Cochrane Street, Glasgow.
,,	24	Clydebank, N.B.—Houses	Town Council	Borough Surveyor's Office, Clydebank, N.B.
,,	24	Cork—Houses	—	City Engineer's Office, Municipal Buildings, Cork.
,,	24	Whittington—School	Education Committee	H. E. Wale, 11 College Hill, Shrewsbury.
,,	24	Penydarren, Merthyr Tydfil—Congregational Church	—	Horeb Chapel Schoolroom.
,,	24	Shepherd's Bush—Sorting Office	Commissioners	J. Wager, H.M. Office of Works, Storey's Gate, S.W.
,,	25	Annan—Extensions to Mill	Messrs. L. & F. Carr	Johnstone Brothers, 39 Lowther Street, Carlisle.
,,	25	Cwm, Mon,—Vicarage	Rev. J. Ll. Croft	E. A. Johnson, Architect, Abergavenny.
,,	25	Glasgow—Building Work on Houses	Corporation	City Engineer, 64 Cochrane Street, Glasgow.
,,	25	Dublin—New Building	Trustees of St. Rieran's College	D. W. Morris, 68 Harcourt Street, Dublin.
,,	25	Shipley—Work required in erection of Extension to Foundry.	—	J. H. Bakes, Calverley Chambers, Victoria Square, Leeds.
,,	27	Sherborne—Additions, &c., to School	—	J. Douglas, Greenhill, Sherborne.
,,	27	Widnes—Enlargement of School	Education Committee	F. U. Holme, 1 Crosshall Street, Liverpool.
,,	27	St. Austell—Residence	A. Shaw, Esq.	B. C. Andrew, Biddick's Court, St. Austell, Cornwall.
,,	27	Ainsworth, Lancs—Hospital	Joint Hospital Board	Henry Lord, 42 Deansgate, Manchester.
,,	27	Bury, Lancs—Cottage	Joint Hospital Board	J. Comfort, Florence Nightingale Hospital, Bury.
,,	27	Raglan, Mon.—Alterations, &c., to School	—	W. H. D. Caple, Church Street Chambers, Cardiff.
,,	28	Batley—Post-office	Commissioners	Secretary, H.M. Office of Works, Storey's Gate, S.W.
,,	28	Preston—School	Corporation	Director of Education, Education Offices, Preston.
,,	28	Gateshead—Wesleyan Church	—	W. S. Ellison, 2 Sir Thomas Street, Liverpool.
,,	28	Dublin—Building	Department of Agriculture and Technical Instruction for Ireland.	Offices of Department, 4 Upper Merrion Street, Dublin.
,,	28	Glanton—Hall	—	Manse, Glanton.
,,	28	Ilford—Fire-station	Urban District Council	Engineer and Surveyor, Town Hall, Ilford.
,,	28	Lydney, Glous.—Shed, &c.	Park Iron Ore and Coal Co.	W. F. Butler, Old Bank Buildings, Chester.
,,	28	Newburgh, N.B.—Church	—	Thoms & Wilkie, 46 Reform Street, Dundee.
,,	28	West Ham—Baths Extension	Town Council	Borough Engineer, Town Hall, West Ham.
,,	28	Waterloo, Lancs—Fire-station	Urban District Council	F. S. Yates, Town Hall, Waterloo.
March	1	London, S E.—Stables	Southwark Borough Council	A. Harrison, 10 Walworth Road, S.E.
,,	1	Carmarthen—Schoolroom, &c., to Chapel	—	Rev. S. Thomas, Parkglas, Cemetery Road, Carmarthen.
		ENGINEERING:		
Feb.	23	Dublin—Arc-Lamp Carbons	Corporation	City Engineer, City Hall, Dublin.
,,	23	Ashford, Kent—Purifier	Urban District Council	J. Norton, Manager at Works, Ashford.
,,	24	Chelmsford—Pumping Machinery	Rural District Council	J. Dewhirst, Avenue Chambers, Chelmsford.
,,	24	Sunderland—Motor Generators	Corporation	J. F. C. Snell, Town Hall, Sunderland.
,,	25	Hoylake, Cheshire—Sea Wall	Lord Stanley	T. Foster, 23 Tower Buildings, Liverpool.
,,	25	Aith Hope, Orkney—Lifeboat Station	Royal Nat. Lifeboat Institution	W. T. Douglas, 15 Victoria Street, S.W.
,,	27	Copenhagen—Gasmeter	Corporation	Valby Gasworks, Valbys, Copenhagen.
,,	27	Salford—Heating Schools	Education Committee	C. K. & T. C. Mayor, 41 John Dalton Street, Manchester.
,,	28	Ashton-in-Makerfield—Gas Plant	Urban District Council	Gasworks, Ashton-in-Makerfield.
,,	28	Newton Abbot, Devon—Lift	Guardians	Workhouse, Newton Abbot.
March	1	Southsea—Reconstructing Pier-head	S. Parade Pier Co.	G. E. Smith, 145 Victoria Road N., Southsea.
,,	1	Naas, Ireland—Reservoir Tank	Rural District Council	D. J. Purcell, Council Offices, Nass.
,,	1	Wrexham—Sewage Tanks	Town Council	J. W. M. Smith, Borough Engineer, Wrexham.
,,	1	Littlehampton—Water Main	Urban District Council	H. Howard, Town Offices, Littlehampton.
,,	2	Whitland, Wales—Hire of Stone-breaker	Rural District Council	Rees Davies, Surveyor, Whitland.
		IRON AND STEEL:		
Feb.	23	Chatham—Fencing	Town Council	C. Day, Town Hall, Chatham.
,,	23	Dundee—Steel Rails	Harbour Trustees	J. Thomson, Harbour Engineer, Dundee.
,,	23	Dundee—Points	Harbour Trustees	J. Thomson, Harbour Engineer, Dundee.
,,	25	Clitheroe, Lancs—Ironmongery	Corporation	Borough Surveyor, Clitheroe.
,,	27	Urmston, Lancs—Gates and Railings	Urban District Council	Council's Surveyor, Urmston, Lancs.
,,	27	Cheshunt—Ironmongery	Urban District Council	R. H. Jeffs, Manor House, Cheshunt.
,,	28	London, S.E.—Ironmongery	Deptford Borough Council	Municipal Offices, 20 Tanner's Hill, Deptford.
March	1	Stoke-on-Trent—Cast Ironwork	Corporation	A. Burton, Town Hall, Stoke-on-Trent.
,,	1	Bromley Cross, Lancs—General Ironmongery	Urban District Council	Surveyor, Council Offices, Bromley Cross.
		PAINTING AND PLUMBING:		
Feb	28	Stratford-on-Avon—Painting and Repairs at House	Town Council	Borough Surveyor's Office, Stratford-on-Avon.
,,	28	London, S E.—Oils and Paints	Deptford Borough Council	Municipal Offices, 20 Tanner's Hill, Deptford.
March	1	Bromley Cross, Lancs—Oil, &c.	Urban District Council	Surveyor, Council Offices, Bromley Cross.
		ROADS AND CARTAGE:		
Feb.	23	Escrick, York—Whinstone, &c.	Rural District Council	F. A. Camidge, 3 Stonegate, York.
,,	23	Brixworth, Northants—Broken Granite, &c.	Rural District Council	W. C. Woodford, 18 Market Square, Northampton.
,,	23	Gateshead—Paving Streets	Corporation	N. P. Pattinson, Town Hall, Gateshead.
,,	23	London, S.E.—Granite Spalls	Guardians	Union Offices, Greenwich.
,,	23	Nottingham—Road Materials	Highways & Bridges Committee	E. Purnell Hooley, Shire Hall, Nottingham.
,,	24	Honiton, Devon—Road Materials, &c.	Rural District Council	E. W. Hellier, Clerk, Honiton.
,,	24	Northallerton—Levelling Roads, &c.	North Riding County Council	W. H. Brierley, 13 Lendal, York.
,,	25	Bridgend, Glam.—Road Material	Glamorgan County Council	T. L. Edwards, Town Hall, Bridgend.
,,	25	Stratton, Cornwall—Road, &c.	Rural District Council	W. J. Dunbar, Liskeard, Cornwall.
,,	26	Harrogate—Street Works	Corporation	F. Bagshaw, Borough Engineer, Harrogate.
,,	27	Mansfield Woodhouse, Notts—Making-up Street	Urban District Council	F. P. Cook, Leeming Chambers, Mansfield.
,,	27	Old Hill, Staffs—Road Stone	Rowley Regis U.D.C.	Council Offices, Lawrence Lane, Old Hill.
,,	28	Hatfield, Herts—Granite and Slag	County Council	U. A. Smith, County Surveyor, Hatfield.
,,	28	Ealing, W.—Road	Town Council	Charles Jones, Town Hall, Ealing.
		Brighouse—Street Works	Corporation	S. S. Haywood, Municipal Offices, Brighouse.

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DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		ROADS AND CARTAGE—*cont.*		
Feb.	28	Lewes—Road Materials	East Sussex County Council ...	F. J. Wood, County Hall, Lewes.
,,	28	London, S.W.—Roads, &c.	London County Council... ...	Housing of Working Classes Section of Architects' Department, Charing Cross Road, W.C.
,,	28	London, S.W.—Cartage of Granite	Middlesex County Council ...	H. T. Wakeham, Middlesex Guildhall, Westminster, S.W.
,,	28	London, S.W.—Cartage of Road Materials	Middlesex County Council ...	H. T. Wakeham, Middlesex Guildhall, Westminster, S.W.
,,	28	London, W.—Road	Town Council	C. Jones, Town Hall, Ealing, W.
,,	28	New Shoreham, Sussex—Road Materials	Rural District Council	E. Cripps, Council Offices, New Shoreham.
,,	28	West Ham—Making-up Streets	Town Council	Borough Engineer, Town Hall, West Ham.
Mar.	1	Bromley Cross, Lancs—Granite, Macadam, &c.	Urban District Council	Surveyor, Council Offices, Bromley Cross.
,,	1	Northampton—Road Materials	Rural District Council	W. Tomalin, 14 Guildhall Road, Northampton.
,,	3	Barking, Essex—Broken Granite, &c.	Urban District Council	Public Offices, Barking.
,,	3	Rawtenstall, Lancs—Street Works	Corporation...	J. Johnson, Municipal Offices, Rawtenstall.
,,	4	South Shields—Road Materials	Corporation...	S. E. Burgess, Chapter Row, South Shields.
,,	6	London, S.E.—Kerbing, &c.	Lewisham Borough Council ...	Surveyor's Department, Town Hall, Catford.
,,	8	Basingstoke—Granite-concrete Tubes	Corporation...	F. R. Phipps, Town Hall, Basingstoke.
,,	14	London, E.C.—Paving, &c.	Shoreditch Borough Council ...	H. M. Robinson, Town Hall, Old Street, S.E.
,,	16	Ormskirk, Lancs—Road Materials	Rural District Council	C. Law-Green, Surveyor to Council, Wigan Road, Ormskirk.
		SANITARY:		
Feb.	23	Chelmsford—Removal of Refuse...	Rural District Council	W. Edser, Avenue Chambers, Chelmsford.
,,	25	Chesterton, Cambs—Removal of Refuse	Urban District Council	Surveyor's Office, Chesterton, Cambs.
,,	26	Ockbrook, Derby—Scavenging	Rural District Council	J. W. Newbold, Becker Street, Ockbrook.
,,	27	Beckenham—Disinfectants	Urban District Council	Council's Office, Beckenham.
,,	28	Stony Stratford and Wolverton—Sewerage Works... ...	Rural District Council	A. E. Abbott, The Square, Wolverton.
,,	28	Wallsend—Scavenging	Urban District Council	G. Hollings, Borough Surveyor, Wallsend.
,,	28	London, S.E.—Disinfectants	Deptford Borough Council ...	Municipal Offices, 20 Tanners Hill, Deptford.
Mar.	1	Wrexham—Sewer	Corporation...	J. W. M. Smith, Borough Surveyor, Wrexham.
,,	1	Bromley Cross, Lancs—Sanitary Tubes, &c.	Urban District Council	Surveyor, Council Offices, Bromley Cross.
,,	1	Llandaff—Scavenging	Rural District Council	M. Warren, Park House, 20 Park Place, Cardiff.
,,	1	Stoke-on-Trent—Disinfectants	Corporation...	A. Burton, Town Hall, Stoke-on-Trent.
,,	2	Southend-on-Sea—Disinfectants...	Corporation...	E. J. Elford, Borough Surveyor, Southend-on-Sea.
,,	3	Barking, Essex—Disinfectants	Urban District Council	Public Offices, Barking.
,,	4	Bilston, Staffs—Sewage-disposal Works	Urban District Council	J. D. Wassell, Town Hall, Bilston.
,,	6	Abram, near Wigan—Sewerage Works	Corporation...	J. Watock, Council Offices, Abram.
,,	7	Boston, Lincs—Sewers	Urban District Council	J. Rowell, Church Lane, Boston.
,,	8	Newport, Mon.—Sewerage Works	Western Valleys Sewerage Bd.	T. S. Edwards, 24 Stow Hill, Newport, Mon.
,,	8	Basingstoke—Sewerage Works	Corporation...	F. R. Phipps, Town Hall, Basingstoke.

List of Competitions Open.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Feb.	28	Aylesbury—School	£50 & £25	£1 1s.	C. G. Watkins, Education Office, Aylesbury.
,,	28	Wolverton—School	—	£1 1s.	C. G. Watkins, Education Office, Aylesbury.
Mar.	4	Nelson, Lancs—Library...	£50, £25 & £15	—	J. H. Baldwick, Town Hall, Nelson.
,,	30	London, S.W.—Municipal Buildings...	—	£1.	H. J. Smith, Town Hall, Kennington, S.W.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

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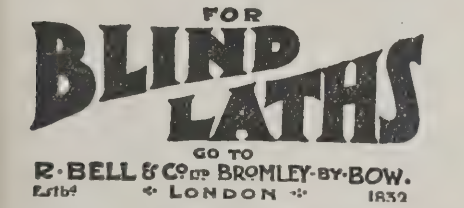

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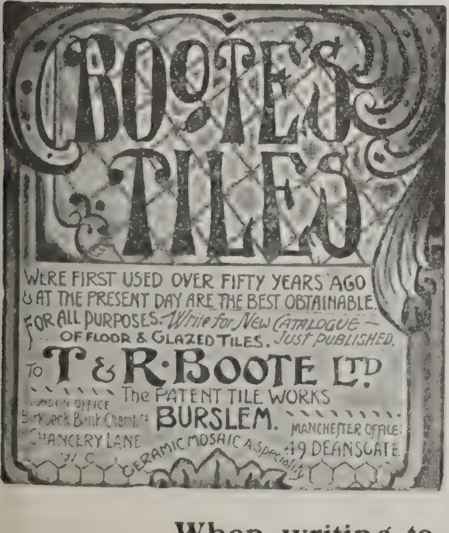

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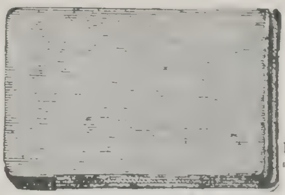

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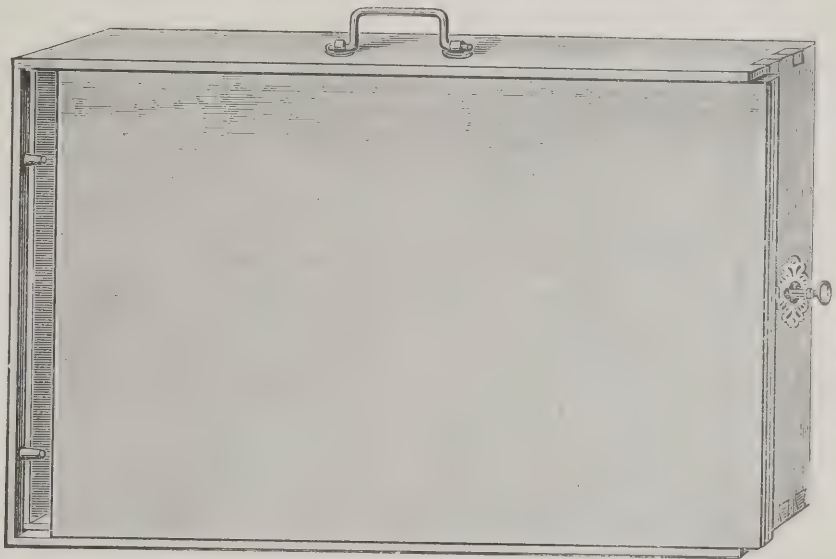

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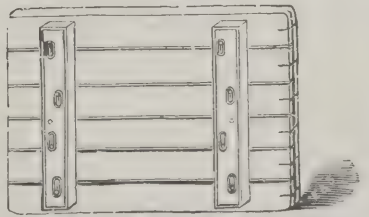

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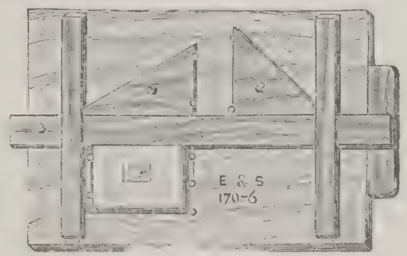

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ARCHITECT'S ASSISTANT, 10 years' experience, desires engagement. Contract drawings, details, designs, specifications, office routine.—H. S., 55, Artesian Road, Bayswater, W. 959

ARCHITECT'S GENERAL ASSISTANT disengaged in March; full particulars.—E. A. J., 27, Doughty Street, W.C. 931

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BRICKWORK and POINTING WANTED. Town or country. rod or lump, good references.—H. H., 31, Stanley Road, East Sheen, S W. 933

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February 25th. Third Spring visit to the New Sessions House, Old Bailey, by kind permission of the Architect, Mr. E. W. MOUNTFORD. Members to meet outside the building at 2 p.m. A visit will afterwards be paid to Messrs. Coutts' Bank, Strand, by kind permission of the Directors and the Architect, Mr. J. MACVICAR ANDERSON. Members to meet outside the building at 4 p.m.

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The lowest or any tender not necessarily accepted.

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954.—ARCHITECT'S ASSISTANT, age 25; wkg. drawings, details, specfins., surveying & levelling.

955.—BUILDER'S CLERK. Bookkeeping, time sheets, &c.; draughtsman; town or country; mod. s.

956.—WORKING FOREMAN. Painter and Decorator, age 32; estimator; colourist; good refs.; abstainer.

957.—QUANTITY SURVEYOR'S ASSISTANT. Taking off, &c. &c., or would accept appt.; ex. refs.

958.—QUARRY MANAGER OR FOREMAN MASON, 20 yrs. exp. mining and quarrying; detail, draughtsman.

959.—ARCHITECT'S ASSISTANT, 10 yrs. exp.; contract dwgs.; details, designs, specifictaions.

960.—GENTLEMAN experienced in cement trade, as London Manager, Branch Superintendent or other responsible position.

961.—GENERAL FOREMAN, practical and experienced in all branches, age 48; trade, carpenter and joiner.

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FORAGE.		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0	1	17	0
Clover, best	per load	3	15	0	4	5	0
Hay, good	do.	3	10	0	3	17	0
Sainfoin mixture ...	do.	3	10	0	3	17	6
Straw	do.	1	12	0	2	2	0
OILS AND PAINTS.							
Castor Oil, French ...	per cwt.	1	0	5		—	
Colza Oil, English ...	do.	1	1	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0		—	
Linseed Oil, barrels ...	per cwt.	0	15	10½		—	
Petroleum, American ...	per gal.	0	0	5¼	0	0	5⅜
Do. Russian ...	do.	0	0	4¾	0	0	4⅞
Pitch	per barrel	0	8	0		—	
Shellac, orange	per cwt.	7	0	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	4	6		—	
Tar, Stockholm	per barrel	1	5	0		—	
Turpentine	per cwt.	1	17	6		—	
METALS.							
Copper, sheet, strong ...	per ton	80	0	0		—	
Iron, Staffs., bar ...	do.	5	15	0	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	2	6	10	5	0
Lead, pig, Soft Foreign...	do.	12	6	3	12	7	6
Do. do. English common brands	do.	12	13	9		—	
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14	0	0		—	
Do. pipe	do.	15	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	5	0		—	
Do. floor brads... ...	do.	9	0	0		—	
Steel, Staffs., Girders and Angles	do.	5	5	0	6	0	0
Do. do. Mild bars ...	do.	6	0	0	6	5	0
Tin, Foreign	do.	131	2	6	131	12	6
Do. English ingots ...	do.	132	0	0	134	0	0
Zinc, sheets, Silesian ...	do.	28	0	0		—	
Do. do. Vielle Montaigne	do.	29	0	0		—	
Do. Spelter	do.	24	15	0	25	0	0
TIMBER.							
Soft Woods.							
Whitewood, American, logs.	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	3	0
Fir, Dantzic and Memel	per load	2	7	6	4	15	0
Pine, Quebec, Yellow ...	do.	4	5	0	7	5	0
Do. Pitch, American...	do.	2	8	0	5	15	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, Mesane, White, 2nd, 3×11	do.	9	15	0		—	
Do. do. Yellow, 2nd, 3×9	do.	15	0	0	15	5	0
Do. do. do. 3rd, 3×9	do.	11	5	0		—	
Do. do. do. do. 3×8	do.	9	5	0		—	
Do. do. do. 4th, 3×9	do.	9	0	0		—	
Do. Norrkoping White, 3×11	do.	7	5	0		—	
Do. St. Petersburg, Yellow, 1st, 3×9	do.	10	10	0	13	15	0
Do. do. do. Unsorted, 3×8	do.	8	10	0	9	0	0
Do. do. do. White, Unsorted, 2½×7	do.	8	0	0		—	
Do. Kallskar Yellow, 5th, 3×9	do.	8	15	0		—	
Do. Söderhamn, Yellow, 3rd, 3×9	do.	12	15	0		—	
Do. Sundsvall, Yellow 6th, 3×9	do.	6	10	0		—	
Do. Skelleftea, Yellow, 5th, 3×9	do.	9	5	0		—	
Do. Nederkalix Yellow, 1st, 3×7	do.	10	5	0		—	
Do. Quebec, Spruce, 3rd, 3×9	do.	9	0	0		—	
Do. Marsouis, Quebec, Spruce, Unsorted, 3×8	do.	8	0	0		—	
Do. do. do. do. 3×7	do.	7	15	0		—	
Battens, all kinds ...	do.	6	5	0	13	10	0
Flooring Boards 1in. prepared, 1st... ...	per square	0	9	0	0	10	9
Do. 2nd	do.	0	7	6	0	10	9
Do. 3rd, &c.	do.	0	7	0	0	9	9
Hard Woods.							
Ash, Quebec	per load	4	0	0	7	10	0
Birch, New Brunswick...	do.	2	10	0	5	5	0
Do. Quebec do. ...	do.	2	10	0	6	0	0
Box, Turkey	per ton	7	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	3½		—	
Do. Honduras ...	do.	0	0	3½		—	
Do. Tobasco	do.	0	0	$5\frac{3}{32}$		—	
Elm, Quebec	per load	4	2	6	8	15	0
Jarrah, planks	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras...	per ft. sup.	0	0	$4\frac{5}{16}$		—	
Do. African ...	do.	0	0	$3\frac{11}{32}$		—	
Do. St. Domingo	do.	0	0	4		—	
Do. Cuba ...	do.	0	0	6¼		—	
Do. Lagos ...	do.	0	0	$4\frac{7}{32}$		—	
Do. Benin ...	do.	0	0	$2\frac{21}{32}$		—	
Do. Tobasco ...	do.	0	0	$4\frac{31}{32}$		—	
Oak, Wainscot	per log.	2	12	6	5	15	0
Do. American quartered, planks and boards	per ft. cu.	0	2	6	0	5	0
Do Dantzic & Stettin	per load	3	0	0	6	10	0
Do. Quebec	do.	4	15	0	8	0	0
Teak, Rangoon, planks...	do.	8	0	0	15	10	0
Do. Indian logs ...	do.	10	0	0	18	10	0
Do. Indian planks ...	do.	13	0	0	20	0	0
Do. Moulmein logs ...	do.	6	10	0	8	0	0
Kauri pine logs	per ft. cu.	0	1	6	0	2	0
Do. do. planks ...	do.	0	3	0	0	3	6

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

During the week ending February 17th thirty-two failures in the building and timber trades in England and Wales were gazetted.

M. G. Martin, plumber, Nottingham. R.O. Feb. 6th.

E. Thomas & Co., builders, Neath. R.O., Feb. 10th.

J. Fuller, builder, Headley. R.O. Feb. 9th.

Advanced Woodworking Co., Edinburgh. Liabilities £3,506; assets £1,667; deficiency £1,838.

J. A. Leonard, builder and contractor, Rochester, Liabilities £5,050; deficiency £3,154.

A. Ferritt, foreman joiner, Stalybridge. R.O, Feb. 11th.

H. J. Harrop, builder, Lewisham. P.E., Greenwich C.C. Feb. 28th, at 1.

H. Blezard, builders' merchant, Blackburn. R.O. Feb. 6th.

W. J. F. Andrews, builder, Tottenham. R.O. Feb. 6th.

F. E. Eales, architect and surveyor, East Twickenham. Adj. Feb. 10th.

J. Phœnix, builder, Finchley. P.E., Barnet Town Hall, Feb. 23rd, at 11.

Townsend & Coles, builders and contractors, Soho and Euston Road, W.C. Adj. Feb. 11th.

R. R. Pearce & Co., timber and builders' merchants, Charlbury. R.O. Feb. 9th.

J. W. Bygate, builder and contractor, Rotherham. R.O. Feb. 10th.

J. T. Jones, plumber and glazier, Saltburn-by-the-Sea. P.E., Middlesbrough C.C., Feb. 24th, at 10.30. First meeting, O.R.'s, Middlesbrough, same day, at 12.30.

Williams & Sons, builders and contractors, Bristol. R.O. Feb. 8th. First meeting, O.R.'s, Bristol, Feb. 22nd, at 11.30. P.E., Bristol Guildhall, March 10th, at 12.

J. Ashton, house-breaker, Hackney. R.O. Feb. 11th. First meeting, London Bankruptcy Court, Feb. 23rd, at 12. P.E., same, March 22nd, at 11.30.

R. Miller, contractor, Kensal New Town. R.O. Feb. 8th. First meeting, London Bankruptcy Court, Feb. 27th, at 11. P.E., same, March 24th, at 12.

W. Murrell, timber merchant, South Hackney. R.O. Feb. 8th. First meeting, London Bankruptcy Court, Feb. 22nd, at 2.30. P.E., same, March 24th, at 11.30.

Hards & Bradly, auctioneers and surveyors, Greenwich, Lewisham and Birchington-on-Sea. R.O. Feb. 11th. First meeting, London Bankruptcy Court, Feb. 24th, at 12. P.E., same, March 22nd, at 11.30.

A. E. Harris, builder and contractor, Hounslow. First meeting, O.R.'s, 14, Bedford Row, W.C., Feb. 24th, at 12. P.E., Brentford Town Hall, March 3rd, at 12.

Collins Brothers, house decorators and electricians. Blackheath. First meeting, O.R.'s, Bristol, Feb. 22nd, London Bridge, Feb. 24th, at 11.30. P.E., Greenwich, C.C., Feb. 28th, at 1.

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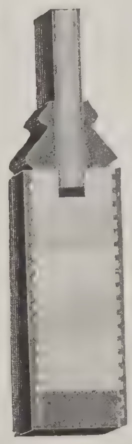

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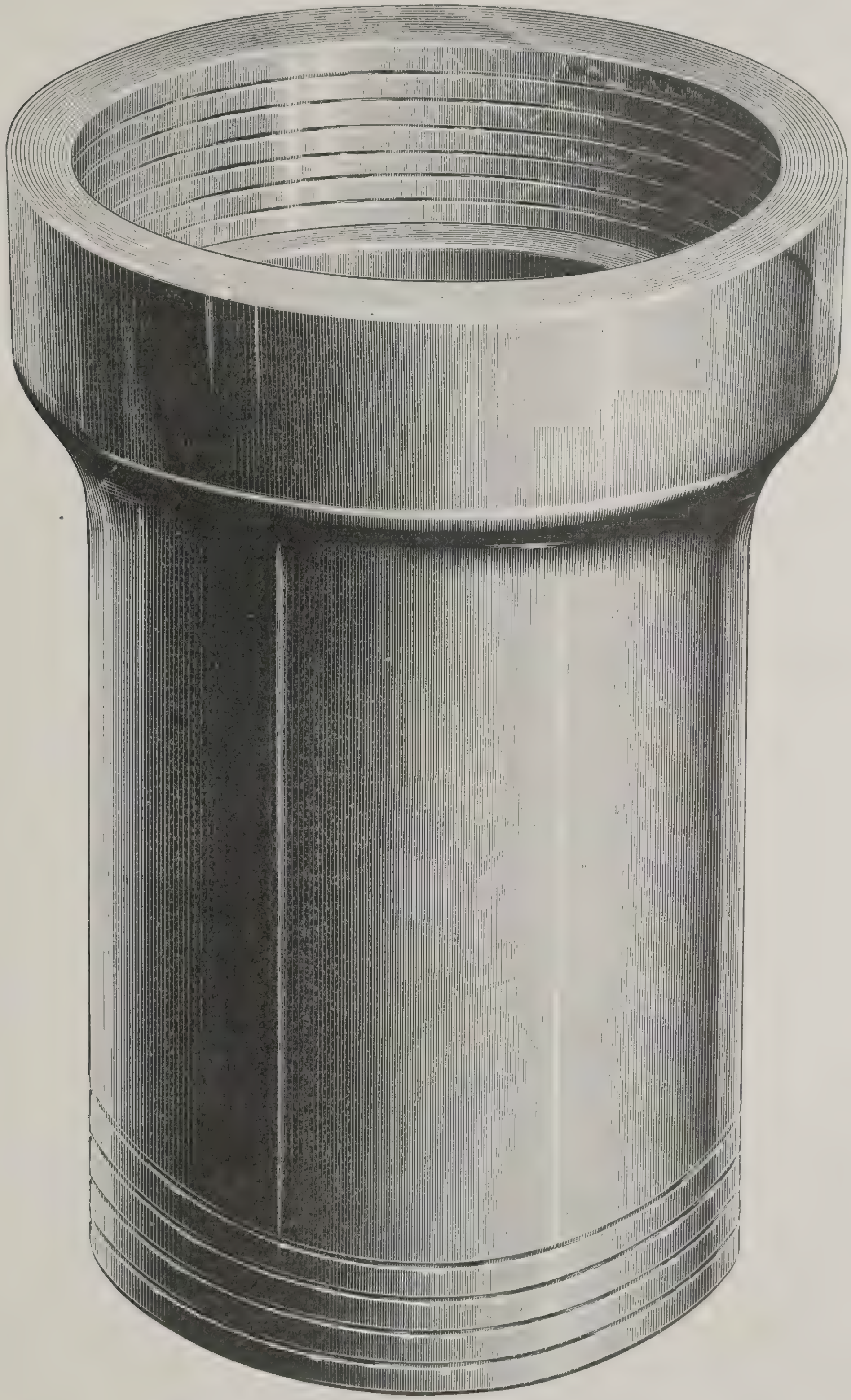

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Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Aldershot.—For the erection of a post-office at North Camp, for H.M. Office of Works, &c. :—

Higgs & Outhwaite	£1,740
G. Kemp	1,525
J. Shelbourne & Co.	1,470
Johnson & Co.	1,460
Crosby & Co.	1,429
Mussellwhite & Sapp	1,420
Martin, Wells & Co., Ltd.	1,350
P. J. Caesar	1,350
W. H. Lorden & Son*	1,349
Drowley & Co.†	1,270
East & Hyde†	1,167

* Accepted. † Withdrawn.

Crieff.—Accepted for additions and alterations to Commissioner Street Public School :—

Masonwork—W. Ellis, Crieff	£2,253	6	9
Joiner-work—J. Stothard & Sons, Crieff	1,406	9	10

Erdington, Birmingham.—Accepted for the erection of council house and free library. Mr. John P. Osborne, F.R.I.B.A., architect, Birmingham :—

Barnsley & Sons	£13,888

Llandaff.—For the construction of about one mile of pipe sewers varying from 12ins. to 15ins. diameter, together with the necessary manholes, for the Llandaff and Dinas Powis R.D.C. Messrs. Baldwin, M.I.C.E., Victoria Street, Westminster, and James Holden, A.M.I.C.E., engineers :—

W. Williams, Cardiff	£10,442	0	0
Mackay & Davies, Cardiff	9,591	9	5
F. Ashley, Cardiff	9,101	10	1
J. Allen & Sons, Cardiff	8,928	19	1
S. L. Harrison & Co., Birmingham	8,596	0	0
Barnes, Chaplin & Co., Cardiff	8,044	14	2
T. Rees, Ely	7,909	6	8
J. E. Evans, Cardiff	7,905	8	4
E. Powell, Whitchurch, Glam.	7,598	12	0
Public Works Co., Westminster	7,303	16	2
G. Rutter,* Romilly Chambers, Barry, South Wales	6,764	19	10

* Accepted.

London, E.—For the erection of a school for blind children on the "Brecknock" site, St. Pancras, for the London County Council Education Committee :—

Killby & Gayford, Finsbury	£2,862	0	0
G. S. S. Williams & Son, Barnsbury	2,840	0	0
Marchant & Hirst, 136, Highgate Road	2,795	0	0
J. Grover & Son, New North Road	2,790	0	0
F. Gough & Co., Hendon	2,781	0	0
A. Porter, Tottenham	2,719	0	0
General Builders, Ltd., Notting Hill	2,715	0	0
Treasure & Son, Upper Holloway	2,692	0	0
Thompson & Beveridge, 151, Harrow Road	2,674	0	0
E. Lawrence & Sons, City Road	2,657	0	0
Stevens Brothers, Seven Sisters Road	2,648	0	0
W. M. Dabbs & Son, Clapton	2,646	0	0
L. H. & R. Roberts, Islington	2,595	0	0
T. L. Green, Holborn	2,587	0	0
Lole & Co., Chelsea	2,492	13	7

London.—For completing the restoration of No. 17, Fleet Street, for the London County Council :—

J. Allen & Sons	£2,950	0	0
T. G. Sharpington	2,888	0	0
H. W. Reason	2,680	0	0
Higgs & Hill, Ltd.	2,654	0	0
H. L. Holloway	2,627	0	0
T. L. Green	2,606	0	0
W. Johnson & Co., Ltd.	2,599	0	0
F. & F. H. Higgs	2,583	0	0
W. Dudley	2,558	18	0
C. Johnson	2,470	4	10
J. Marsland & Sons	2,349	6	0
Martin, Wells & Co.	2,166	0	0
W. Downs,* Hampton Street, Walworth Road, S.E.	2,149	0	0
B. E. Nightingale	2,067	0	0

* Recommended for acceptance.

London, N.—For the erection of three pairs of semi-detached houses on the Regent's Park Road Estate, Finchley, for the Birkbeck Bank. Mr. T. Merrison Garood, architect, Birkbeck Bank Chambers, W.C. :—

H. Line	£4,680
J. Johnson & Sons	4,538
Read & Wilkinson	4,480
C. Wall, Ltd.	4,250
W. J. King	3,798
A. W. Jaggers & Co.,* Albert's Works, Deptford, and Bromley-by-Bow	3,240
J. Roberts	3,150

* Accepted (including extras).

London, E.—For the erection of school in Senrab Street, Stepney, for the L.C.C. :—

T. Rowbotham, Birmingham	£24,575	0	0
Sabey & Son, Islington	23,515	0	0
J. Shelbourne & Co., 70, Fenchurch Street	22,670	0	0
A. E. Symes, Stratford	22,461	10	4
W. Johnson & Co., Ltd., Wandsworth Common	22,417	0	0
E. Lawrance & Sons, City Road	22,185	0	0
B. E. Nightingale, Albert Embankment	21,971	0	0
Higgs & Hill, Ltd., South Lambeth	21,963	0	0
J. Appleby & Sons, Lambeth	21,744	0	0
J. Garrett & Son, 17, Balham Hill	21,720	0	0
Stimpson & Co., Battersea	21,700	0	0
Wisdom Brothers, Isleworth	21,681	0	0
Treasure & Son, Upper Holloway	£21,674	0	0
Martin, Wells & Co., Ltd., Vauxhall	21,346	0	0
F. & T. Thorne, Isle of Dogs	21,273	0	0
J. Smith & Sons, Ltd., South Norwood	21,196	0	0
Rowley Brothers, Tottenham	21,172	12	0
Oak Building Co., Ltd., Cambridge	20,899	0	0
J. & M. Patrick,* Point Pleasant, Wandsworth	20,662	0	0

* Recommended for acceptance.

[Architect's estimate, £18,926.]

Richmond (Surrey).—For the rebuilding of the "Black Horse" public-house. Mr. Herbert Riches, architect, 3, Crooked Lane, King William Street, London, E.C. Quantities supplied :—

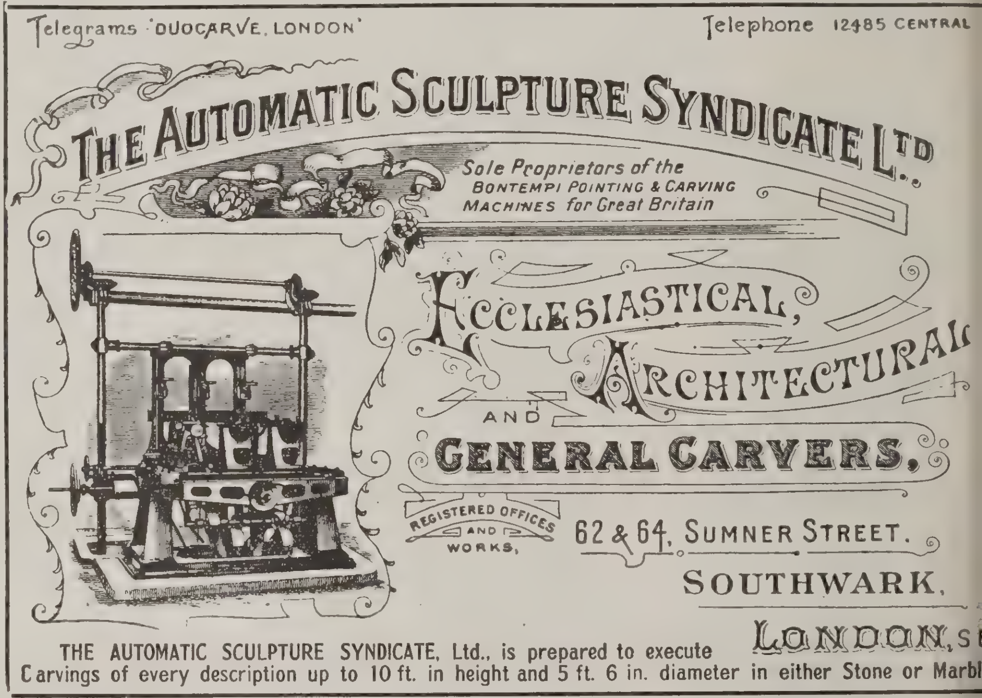
W. R. Williams	£4,275
Adamson & Sons	4,275
Sheffield Brothers	4,242
Todd & Newman	4,000
Soole & Sons	3,995
Courtney & Fairbairn*	3,933

* Accepted.

Southend-on-Sea.—For the erection of houses in St. Mary's Avenue West, for Mrs. C. C. Herbert. Mr. C. Cooke, architect, Southend-on-Sea :—

E. Tomkins	£1,800
Whur & Campkin	1,700
H. R. Wilkinson	1,585
C. Wingrave*	1,575

* Accepted.



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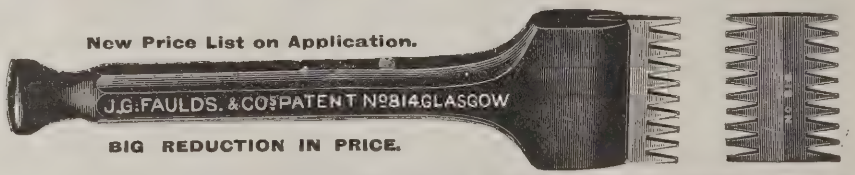
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Mansfield Woodhouse (Notts).—For sewerage and sewage-disposal works, for the U.D.C. Messrs. George & F. W. Hodson, engineers, Westminster and Loughborough :—

Harrison & Co., Birmingham...	£12,000	0	0
G. Lawson, Glasgow	11,517	0	0
A. Eastwood & Sons, Warsop	10,648	0	0
G. Bell, Manchester	10,159	4	0
J. F. Price, Nottingham	9,834	17	6
W. Moss & Sons, Ltd., Loughborough	9,700	0	0
H. Ashley, Mansfield	9,450	0	0
Lock, Andrews & Price, Nottingham	9,400	0	0
A. J. Cottle, Sutton-in-Ashfield	9,160	15	0
J. Byrom, Bury	9,132	10	0
Lane Brothers, Mansfield	9,110	6	0
Firth & Co., York	8,900	0	0
Tweltridge & Moore, Mansfield	8,765	0	0
W. Brigg, Bradford	8,650	0	0
Parker & Sharp, York	8,529	8	6
J. & J. Warner, Mickleover	8,437	0	0
Barker Brothers, Bradford	8,420	0	0
Bower Brothers, West Bridgford	8,400	0	0
Ward & Tetley,* Bradford	8,368	14	9

* Accepted.

Ossett.—Accepted for the erection of the proposed town hall :—

Excavator, mason and bricklayer			
Messrs. Mercer & Robinson, Ossett	£5,799	0	0
Carpenter and joiner—			
Messrs. J. Akeroyd & Son, Birstall...	2,950	0	0
Plumber and glazier—			
F. Newsome, Dewsbury	930	0	0
Plasterer—			
W. Platts, Wakefield	1,150	0	0
Slater—			
Messrs. Pickles Brothers, Leeds	327	10	0
Painter—			
C. Habergham, Morley	230	0	0
Hot-water engineer—			
Messrs. Matthews & Yates, Ltd., Leeds	380	0	0

[Total £11,766. 10s.]

South Shields.—For rebuilding business premises, 32, Fowler Street, for Councillor J. W. Henderson. Mr. Fred. Rennoldson, architect, South Shields :—

J. Young	£1,405	0	0
J. C. Nichol	1,385	0	0
A. Ross	1,375	10	0
G. Thornton & Co.	1,317	8	0
Sneriff & Sons	1,300	0	0
W. Wilson & Sons	1,295	5	0
T. Banks	1,268	9	0
J. Carruthers	1,216	18	6
B. Harper	1,212	16	6
W. Allison*	1,200	2	1

* Accepted. [Quantities by architect.]

Electrical Notes.

Private Mains across a Street.—A correspondent in the "Electrical Review" raises an oft-recurring question on this point. He is in charge of an isolated plant, with other premises across the street which is desired to be lighted from the plant, and he asks whether he can carry cables overhead across the street; to which our contemporary replies that he is perfectly at liberty to do so. The only conditions are that he complies with the Board of Trade regulations as to mode of suspension, &c., and that he obtains the necessary wayleaves from private owners whose property is crossed by the overhead mains. The corporation cannot interfere with him or with his cables unless it owns the freehold of the roadway. The cables must not be less than 30ft. from the street level (in London 35ft.).

"Earthing" to Gas and Water Pipes.—An interesting paper on "Earthing" was read before the Institution of Electrical Engineers at Glasgow last week by Mr. W. W. Lackie, who pointed out that gas pipes should not be used as earth connections, as frequently the current which flows to earth when a conductor gets in contact with an earth is sufficient to melt a soft metal pipe; and further, the method of jointing a branch gas pipe of iron to a main gas pipe often does not make a good contact between the branch and main, the branch pipe being in some cases insulated by brown paper and white lead. A water pipe is almost universally used for an earth connection. All electric conductors should be kept away from gas pipes and most carefully insulated from them by a spacing not less than 1in. thick, no matter what system of wiring be adopted.

Parcels Delivery on Tramways. The Manchester Corporation have decided to adopt a parcels-carrying scheme on the electric tramways of the city. Parcels will be despatched every quarter of an hour, and taken to their destinations by boys or in carts. The charge for the inside area will be 2d. to 6d. for 14 lbs. and 112 lbs. respectively, and delivery in the outside area will be from 3d. to 8d. for those weights.

A Steel Chimney.—In connection with proposed extensions to the corporation electricity-generating station at Portsmouth, Messrs. Kincaid, Waller, Manville & Dawson recommend the erection of a steel chimney shaft, lined throughout with firebrick, 11ft. internal diameter at the top, with brick base supported on concrete and steel foundations; height above firing-floor level, 200ft. The cost of this chimney is put at £4,300, and the total cost of the work at £7,689.

New York Tramways.—The conduit system of tramways alone is permitted in New York proper (Manhattan Island), though the overhead system still prevails in Brooklyn and the outlying districts, and also in Jersey City. In all there are 210 miles (counted as single track) of conduit lines in New York, compared with the 185 miles of tramways (also counted as single track) in the county of London. In New York a universal 5-cent fare ($2\frac{1}{2}$d.) is charged, but as the transfer system prevails (entitling a passenger by the payment of one fare to a continuous ride over two or more lines), so large a proportion of passengers take advantage of it that the average fare per journey is reduced to $3\frac{1}{8}$ cents, or very slightly more than $1\frac{1}{2}$d. A single fare under this system may be made available for a distance of 15 miles. The average speed on all the lines is 10 miles per hour, as compared with 8 miles for London.

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West End Warehouse and Showrooms: 60, GREAT MARLBOROUGH STREET, REGENT STREET, W.
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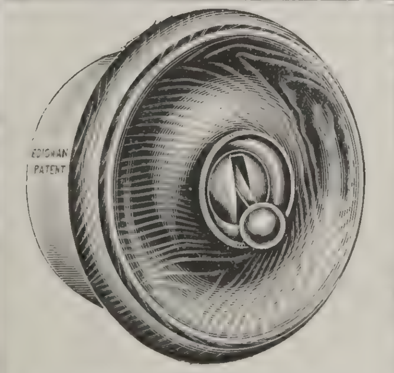

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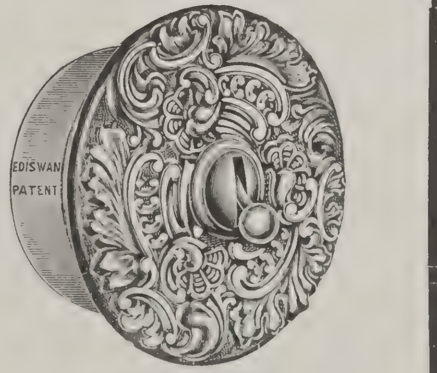

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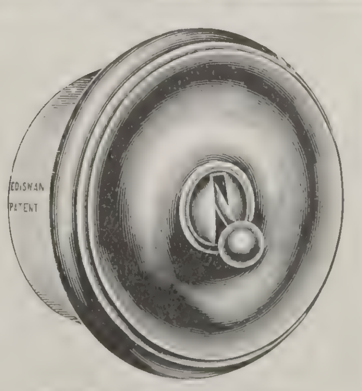

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927.—Architect's Assistant (24). Contract drawings, details, &c. Surveying assistance with quantities.

930.—Architect and Civil Engineer's Assistant. 10 years' practical exp., quantities, estimates, &c.

931.—Architect's General Assistant disengaged in March.

932.—Architect's Assistant (24), 9 yrs. exp. Design, wkg. drawings, detail, specification.

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861.--Builder's Clerk wants two days per week, abstracting, p.c., and jobbing acs.

869.—Builder's Clerk and Draughtsman (23), wkg. and detail drawings, tracings, quantities, estimating, contract and jobbing.

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882.—Builder and Contractor's Clerk. P.C. accounts, book-keeping, drawing, and quantities and estimating, ex. refs.

887.—Builder's Clerk and Assistant. Life exp. jobbing work. Estimating decorating and sanitary work, good refs., mod. s. Could manage.

906.—Builder and Contractor's Clerk. P.C. bookkeeping, shorthand and typewriting, ex. refs.

946.—Builder's Clerk, P.C. accounts, bookkeeping, drawings, quantities and office routine, mod. s., ex. refs.

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880.—General Foreman, 35, good manager and organiser, used to West End. Experienced. Trade. joiner; abstainer.

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902.—House Painter, &c. (36), wants foremanship; 20 yrs. varied exp., 14 yrs. last two masters.

903.—General Foreman (50) seeks re-engagement, 28 yrs. foreman's exp.; carpenter by trade; 1st class refs.

925.—General Foreman (50); 21 yrs. London exp. as Foreman. Used to best work, 1st cl. refs.

926.—Shop Foreman (Joiners), or leading hand, good stair-builder, quick and accurate setter out. Foreman 8½ yrs.

928.--General Foreman (36), Country estate. Thoroughly practical, abstainer; joiner, 1st class refs.

943.—General Foreman, practical. Knowledge of all branches of building trade; 20 yrs. exp., good refs. Carpenter and joiner, abstainer.

MISCELLANEOUS.

885.—Stone Turning by exp. man, day or piecework. Balusters and finials a speciality.

908.—Leaded Lights, Manager and Designer, trustworthy, experienced, good refs., age 31.

909.—Machinist (Joiner), used to 1st class work, good refs.

910.—Quantities. Taking off, working up, mod. terms.

911.—Electrician. Light, bells, and telephone plant, &c.

914.—Manager or other responsible post wanted. Thorough knowledge of building and decorating trades and estate managing. 8 yrs. in builder's and contractor's.

933.—Brickwork and Pointing wanted, town or country, rod or lump. Good refs.

942.—Builders' Assistant, age 23. Competent, office or outside; books quantities; estimating; abstainer. Draughtsman, ex. refs.

PLUMBERS & FITTERS.

899.--Plumber, good; can take on new and old work; good refs.; 20 yrs. last job.

901.—Plumber wants employment, town or country; can turn hand; wages moderate if constant.

905.—Good Plumber, gas, hot-water and zinc joiner, repairs; draughtsman estate, institution or builder; 12 yrs. refs.

QUANTITY SURVEYORS.

894.—P.A.S.I (Bldg. Sub-division), good all-round exp.; wkg. and detail drawings, surveying, &c.; mod. s.

897.—Quantity Surveyor and Builder's Assistant wants temporary or permanent work; ex. refs.

For "Too Late for Classification" see page xvii.

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THE

BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

March 1, 1905. Vol. 21, No. 525. 6, Great New Street, Fetter Lane, E.C.

Summary.

Electric hoists and derricks on building operations have many advantages. They are under perfect control, can be moved about with the greatest facility, are economical in working, and are cleaner, cheaper and better than steam hoists. A standard tramway type of 25-h.p., when connected to a winch through double reduction gearing, will lift 1,800 lbs. at the rate of 150ft. per minute, and it will do it day in and day out without winking and at a cost of about one-third to one-half that of a steam hoist for similar service. (Page 110.)

Very great progress is being made with the erection of the Ritz Hotel in Piccadilly. The steelwork is now up to the seventh floor and the stone casing up to the first. (Page 111.)

Mr. Stuart Jones is giving up his directorship of the British School at Rome. (Page 120.)

An action has been decided in favour of the Accrington Brick and Tile Co., Ltd., and others, against a firm making bricks ten miles from Accrington and falsely calling them "Accrington facing bricks. (Page 120.)

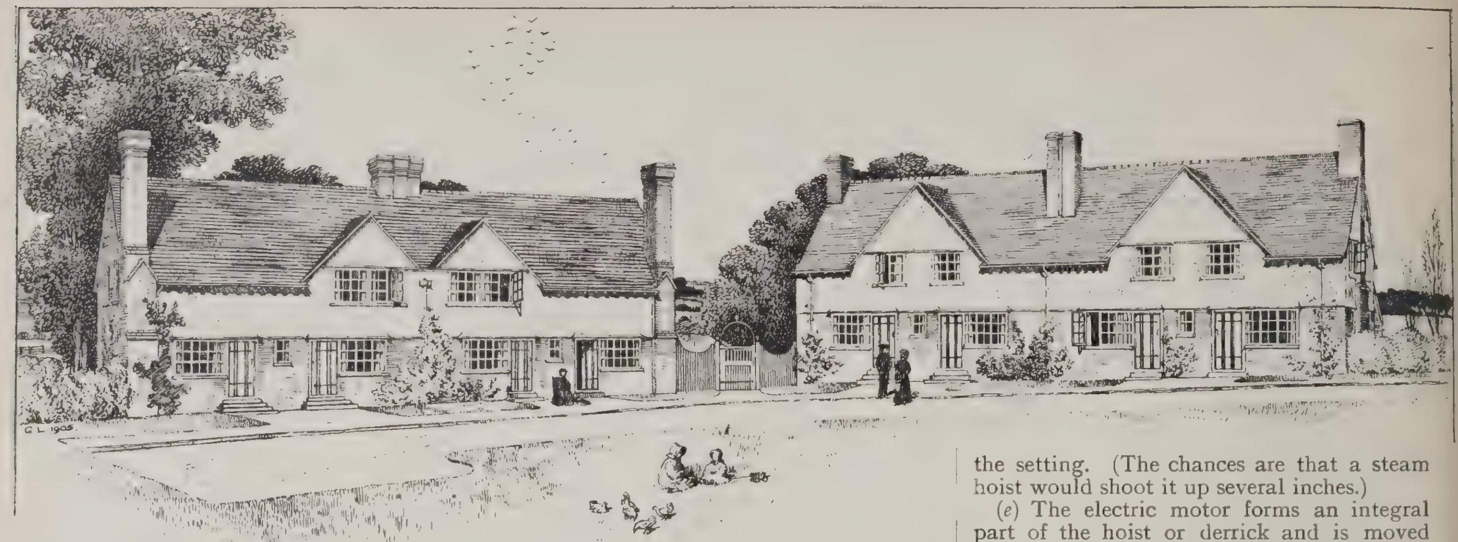
Speaking at the annual dinner of the Edinburgh Architectural Association Mr. Crabb Watt, K.C., referred to the Usher Hall, observing that if the Association asserted its views more forcibly the demolition of a not untasteful structure in the Synod Hall, and the waste of money which could go to the beautifying of a hall on a vacant site, might be prevented. (Page 119.)

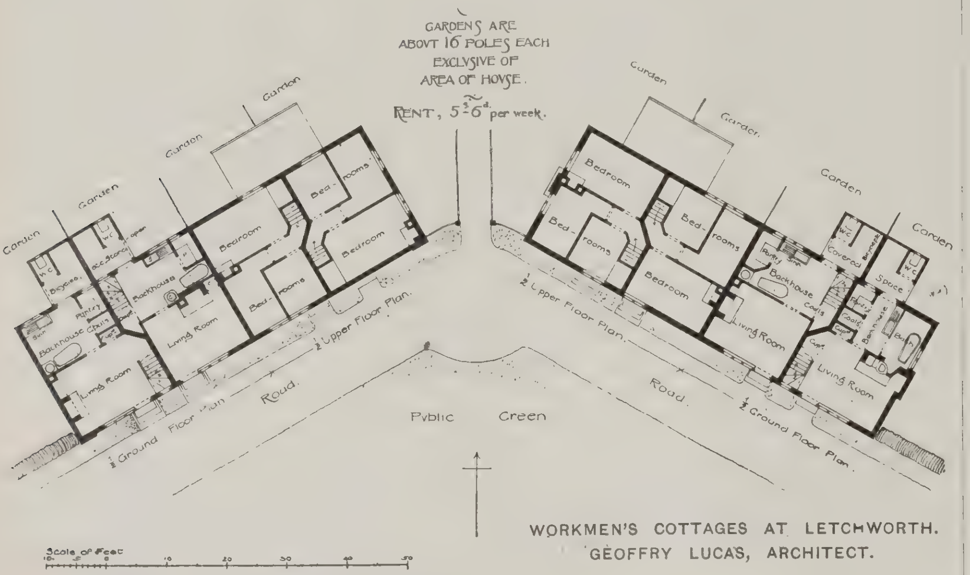
The figure of "Victory" on the Victoria Memorial will probably be of bronze gilt, while the rest of the work will be of white Carrara marble, the figure of the late Queen being 13ft. high. (Page 120.)

In a paper on country houses which he read before the Architectural Association last Friday Mr. J. Osborne Smith said that architects should "design in beauty and build with truth," but there was no reason why truth should take the form of twisted pipes over the fronts and roofs of their buildings. Speaking of sanitary fittings, he said a pedestal closet should be of the wash-down type, not the "wash-out"; urinals should always be avoided in houses, as they were a nuisance at best—the outlet usually supplied with them (in one piece of fireclay) was almost useless. Traps from lavatory basins should be of $1\frac{1}{4}$ins. diameter, while those from baths and sinks (except scullery sinks) should be of 2ins. diameter; scullery sinks should be $3\frac{1}{2}$ins. at inlet. (Page 115.)

The air in the House of Commons is now washed by a new type of water screen, a much more powerful intake fan has been erected, and the passages joining the main airways are more effectively isolated than they were. Further tests are to be made. (Page 118.)

Bitumen. FROM time to time a feeble protest is made against the flagrant misuse of the terms bitumen, asphalt and asphaltum—generally by some engineer or architect who has found himself deceived in a material he has used or contemplates using. It cannot be gainsaid that more often than not the misapplication of the terms is part of a scheme of deception by which manufacturers and others hope to conceal the real nature and composition of the article they have to sell. Such deception is greatly furthered by the ignorance of engineers and architects, who should at least make themselves cognizant of the materials they employ. But at present we find included under the generic term of asphalt a whole host of materials, good, bad and indifferent, many of which have none of the attributes of true bitumen or asphalt, and whose use must be inimical to the works upon which they employed, and to the reputation of the exceedingly useful natural material whose name they have usurped. Asphalt is of course closely identified with bitumen, its chief constituent. Bitumen, as is perhaps known, is one of that subtle family, the petroleum hydro-carbons, the vagaries of which are not yet properly understood, but which present an increasing scale of viscidity, from marsh gas (observable by stirring up most stagnant ponds) through naphtha, petroleum, to bitumen, which last is found in three states, either as liquid-pitch or maltha, "live" or semi-liquid pitch, or as solid "glassy" or "glance" pitch. Examples of these three states are found in many parts of the world, notably in America, which is rich in hydro-carbon deposits. For the origin of bitumen there are two theories, both having a considerable body of adherents. The first regards bitumen as an ultimate distillate of vegetable and animal remains; but when one considers the relatively minute amount of pitch in either a body or a tree compared with the immense deposits of hydrocarbons that exist in, say, the Caucasus or Philadelphia, one has to presuppose the previous existence of men and trees in unthinkable quantities. But the deposits of petroleum are below the coal measures, of admittedly vegetable origin. No valid reason has been adduced for these two different products from the same material. Further, no explanation has been given why hydro-carbons are found in such quantities in some places and not at all in others. We are inclined to pin our belief to the second theory, that of Mendéleeff, the celebrated Russian chemist. This supposes that during the upheaval of the mountain ranges great volumes of water poured down the crevasses in the mountain slopes, and reaching to the heated metallic kernel of the earth (iron carbide) set up chemical action, forming iron oxide and the petroleum hydro-carbons. The latter would probably be in the form of naphtha. An illustration of this action is afforded by the recent terrible catastrophe at Martinique. We have the evidence of eye-witnesses that the first manifestation was the sea running right back from the land; the water no doubt disappeared down a chasm in the sea floor. This was immediately followed by the blowing up of the volcano and the overwhelming of St. Pierre by a rain of fire; doubtless the intrusion of the water resulted in violent chemical action, forming naphtha, blowing up the mountain and precipitating a rain of burning naphtha over the unfortunate city. The Mendéleef theory is supported in several different ways. First, the principal bituminous deposits are found in the immediate vicinity of mountains, particularly those of volcanic origin. Secondly, all natural bitumen contains sulphur, which is not found in the artificial pitches. Thirdly, many of the deposits of "glance" pitch in the United States, such as "albertite," "gilsonite," &c., are found in such positions as to confirm the Mendéleeff theory that they were concomitants of volcanic action. "Gilsonite," for instance, is a pure black glassy-looking bitumen (95 to 98 per cent. pure) found in Utah as veins in the hard rock, having been forced up into the natural cracks and fissures, which it has completely filled. Some of these veins are 10 miles in length, and vary from $\frac{3}{16}$in. to 18ft. in thickness. Of the "live" deposits of bitumen the most famous is the Trinidad Pitchlake, in extent about 110 acres. The Bermudez lake in Venezuela has an area of over 1,000 acres. Both lakes are very similar in appearance. They have shifting pools of water, low vegetable scrub and small trees on the surface. The pitch is a chocolate-coloured earthy-looking substance. In the centre of both lakes it is soft enough to show foot prints, and may be too soft to walk on in hot weather. At the sides the pitch is hard and blacker. In both lakes the material moves or flows, any holes made in the surface being filled up from the sides. The pitch is dug with pick and shovel. There are differences between the deposits, however. The Bermudez is much purer than the Trinidad pitch, but not so stable. The latter is emulsified with water and has a considerable percentage of impurity—about 50 per cent.—mainly consisting of fine clay and vegetable ash from the vegetation on its surface. The Bermudez lake is more liquid; it has several liquid pitch or maltha springs, the largest being 7 acres in extent. So far we have only touched on the origin of bitumen; in a future note we shall deal with its connection with asphalt.





WORKMEN'S COTTAGES AT LETCHWORTH.
GEOFFRY LUCAS, ARCHITECT.

COTTAGES AT LETCHWORTH.

THESE eight cottages for the First Garden City, Ltd., have been built at Letchworth, on the company's estate near Hitchin, in Hertfordshire. The contract amount was £1,510 (including drainage and £10 for contingencies). This is at the rate of £188 15s. per cottage and works out at 5¼d. per foot cube. Each cottage has 16 poles of garden ground adjoining, and the average rental is proposed to be 5s. 9d. per week. The cottages face on to a small common green. The accommodation provided in each cottage consists, on the ground floor, of a living-room 14ft. 4½ins. by 11ft. 3ins. and a back house 10ft. 6ins. by 9ft. containing copper and sink; also a china cupboard, coal-house, pantry, covered space and w.c. Upstairs each cottage has three bedrooms, the largest of which is provided with a fireplace, the other rooms having ceiling ventilators. One of the cottages is fitted with a patent range with copper and bath, presented by Councillor James Cornes, of Leek, and it has been decided to provide baths in the other cottages at a slight addition to the contract amount. The materials employed are local red bricks for facings, lias-lime rough-cast for the upper storeys, and red-tiled roofs with half-round ridge tiles. The outbuildings are of Stockholm tarred weather-boarding. The cottages were erected by Messrs. T. Raban & Sons, contractors, of Baldock, Herts; Mr. Geoffry Lucas, A.R.I.B.A., of 2, Vernon Place, Bloomsbury Square, W.C., and Bancroft, Hitchin, being the architect.

ELECTRIC HOISTS AND DERRICKS FOR BUILDING OPERATIONS.

By E. Kilburn Scott, A.M.I.C.E.

WHILST in Philadelphia recently the writer saw some electric hoists and derricks in use on the new Wanamaker skyscraper building, now being erected. The noiselessness and rapidity with which they worked was remarkable, and not the least pleasing feature was the complete absence of smoke and steam, which are necessary accompaniments of small steam engines and boilers. No one ever thinks of testing such engines, but they would probably run quarry-winding engines a close race as the most wasteful in the world. On the other hand, an electrically-driven hoist has the following advantages:—

(*a*) The electric motor being essentially a high-speed machine, it is therefore easy to attain a high speed of wind with a minimum of gearing.

(*b*) As the electric motor has no dead centre, it starts with the same torque whatever the position of armature, and consequently there is no jerking of the load.

(*c*) The regulation of an electric motor is under the most perfect control, and by the use of a water resistance the current can be adjusted to such a nicety that a piece of masonry or a girder may be settled down as gently as a feather.

(*d*) In case a stone requires slewing round slightly, the electric motor can be rotated just sufficient to take the weight, so facilitating the setting. (The chances are that a steam hoist would shoot it up several inches.)

(*e*) The electric motor forms an integral part of the hoist or derrick and is moved about with it with the greatest facility. On a very high building current is taken up to the motor by a light insulated cable, whereas to lift coal up to a steam boiler is both objectionable and costly; consequently the steam plant is usually in the basement and the progress of the work is not so great, by reason of the driver being away from where the material is delivered.

(*f*) An electric motor is absolutely unaffected by frost, snow or rain when it is completely enclosed. Indeed, on the top of a building and in the open it is working under less onerous conditions than the motors of a tramcar, which travel all day within a few inches of the mud and slush of a street. In cold weather a steam crane has considerable condensation, and under certain circumstances cannot be worked at all.

(*g*) The skill required to work an electric hoist is less than that for a steam hoist, with its boiler, pump and engine, &c. When work is over for the day an electric motor does not require any more attention than possibly occasional renewal of brushes, or oil on bearings. Again, in starting up in the morning there is no time lost, as is the case with a boiler, which must have fires lighted, steam raised, engine warmed up, &c. The electric motor can be switched right into its work directly the 6 o'clock bell goes.

(*h*) There is no insurance to take out with an electric hoist, whereas a boiler must not only be insured but also officially inspected regularly. Even so, there is considerable danger with such small boilers.

(*i*) Water is apt to give trouble with steam hoists because it may not be good enough for boiler purposes by reason of depositing scale; whilst if the crane is at an elevation the water must be taken up to the boiler in buckets, which is a nuisance. In an electric hoist the resistance may be all metallic, but even if water resistances are employed a bucketful a day is enough and any town's supply will do, even if it is hard.

(*j*) The electro-magnetic brake is at once the simplest and safest of any form of brake. It comes into action directly current is cut off or anything goes wrong, and the safety of the thousands of electric lifts, hoists and cranes in buildings is a testimonial to its certainty of action.

(*k*) The running cost of an electrically-driven building crane or hoist is bound to be less than steam, for the same reason that electricity has ousted all other methods of driving overhead travellers. So much is this so that crane makers have practically stopped making any type except electric.

(*l*) One very useful feature of electric hoisting apparatus is that for lifting iron or steel an electro-magnet can be employed instead of hooks and chains. In this way anything made of iron or steel can be handled quickly

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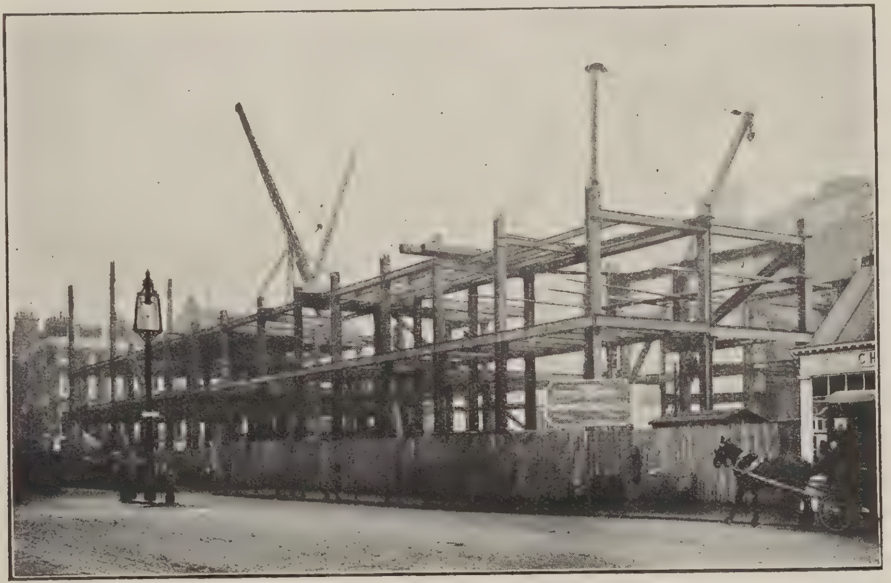
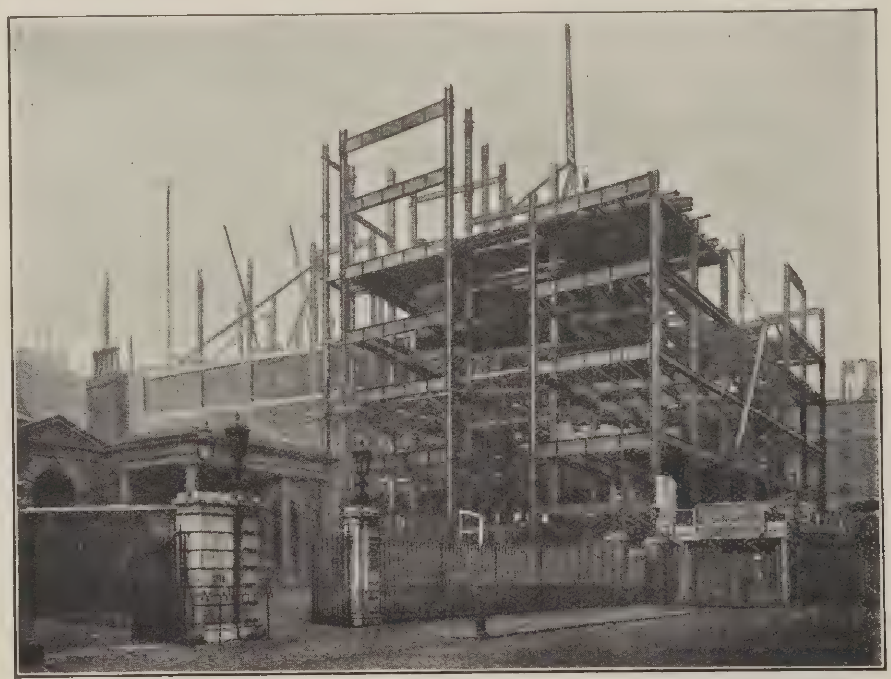
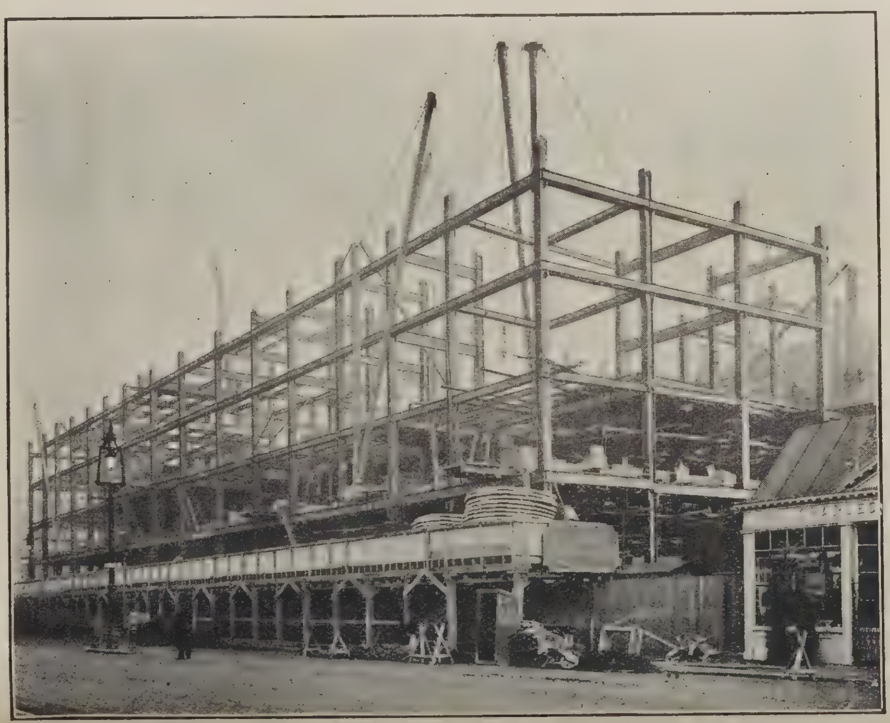


Piccadilly Front, December 19th, 1904.



View from Arlington Street, February 1st, 1905.



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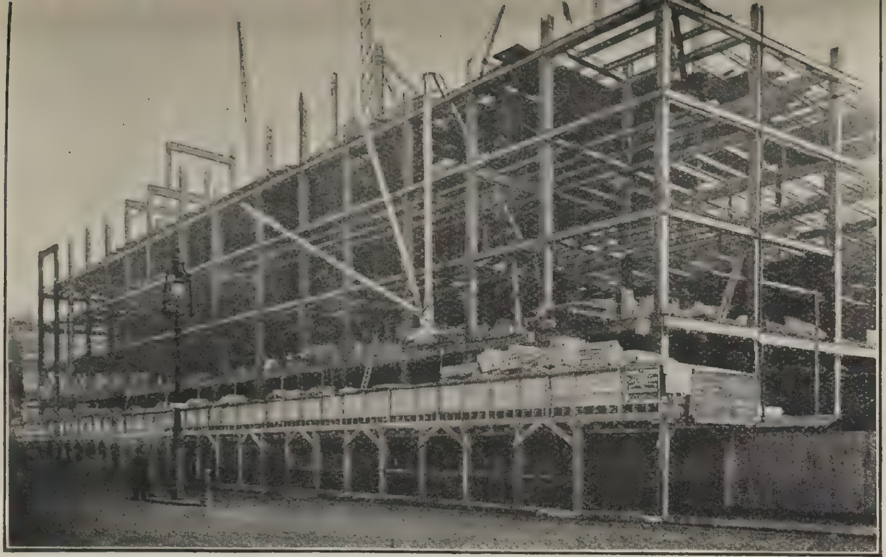

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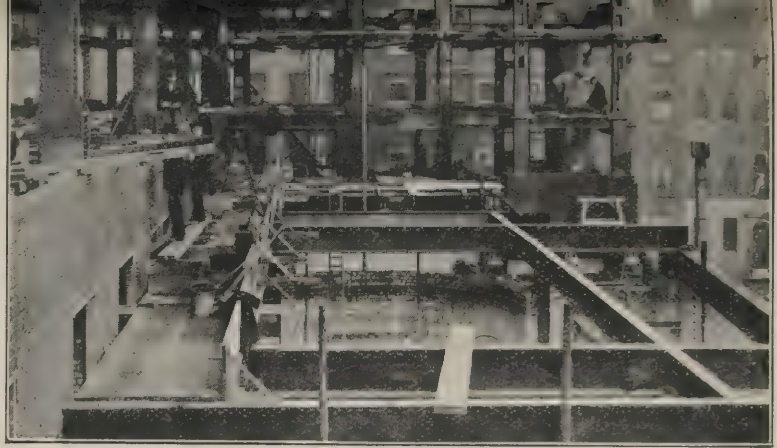
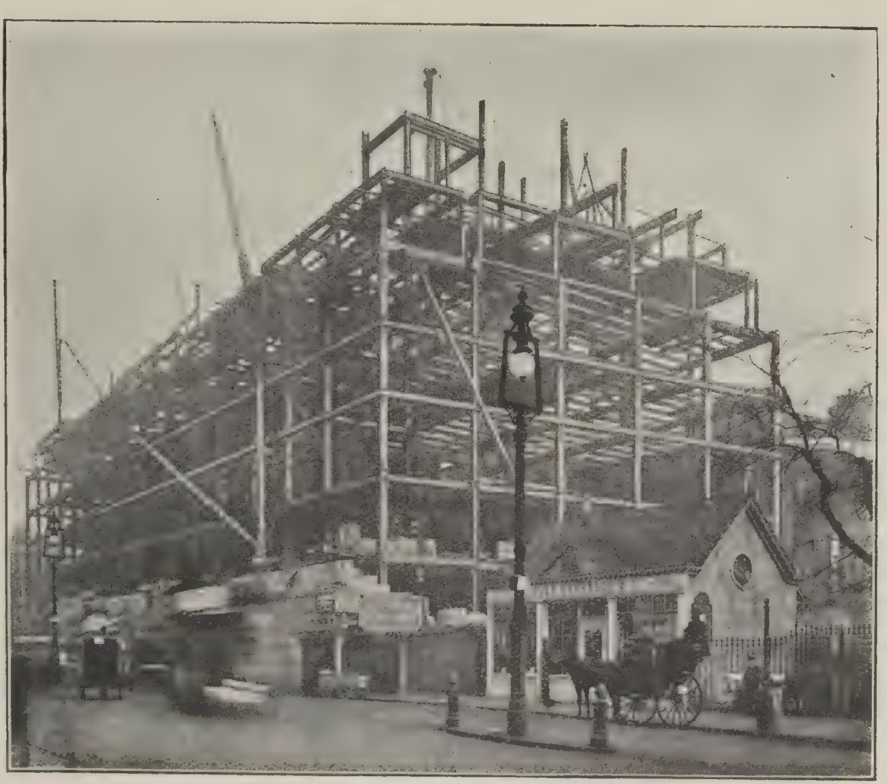
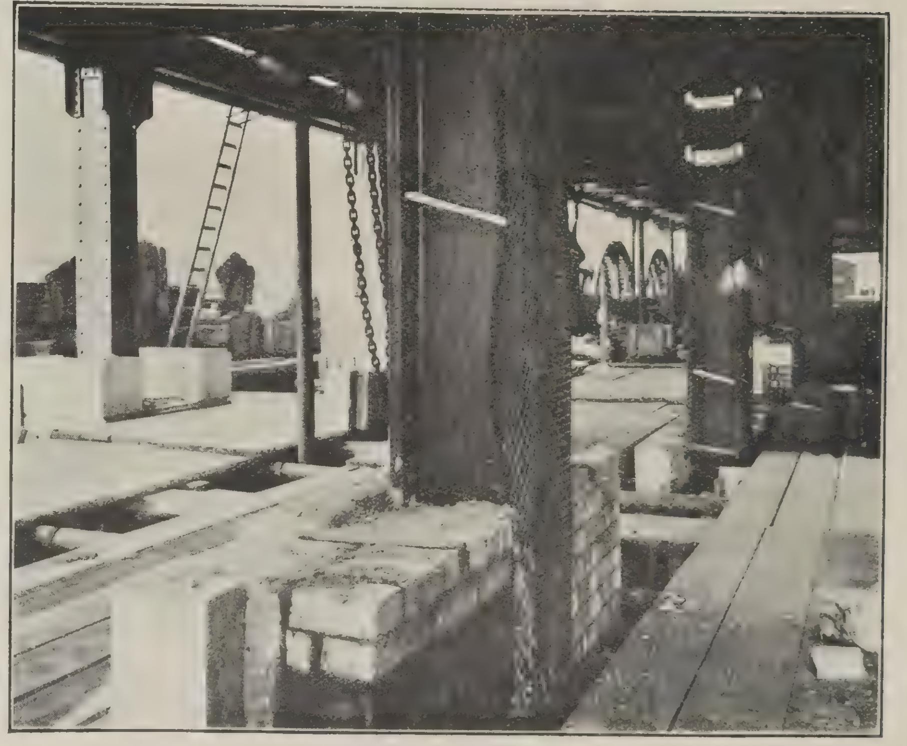


Steelwork at Back, showing Erection of Chimney (February 21st, 1905).



February 21st, 1905.



View at First-Floor Level, February 1st, 1905.

RITZ HOTEL, PICCADILLY LONDON. MEWES AND DAVIS, ARCHITECTS. M. A. POTTS & CO., ENGINEERS. WARING WHITE BUILDING CO. LTD., CONTRACTORS.

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with a minimum of labour, as is the case in engineering and steelworks. For buildings erected on the steel-skeleton plan the electric magnet should be very useful.

One could go on giving other advantages of electric-driving and disadvantages of steam, but surely sufficient has been stated to convince the most sceptical.

The question may be asked, Why then do not the large building firms adopt electric hoists? Well, as a matter of fact all the most up-to-date firms in the States and Canada have done or are doing so, and directly others know the results they will follow suit. Of course, in all businesses there are fossils—men who prefer to jog on in the old groove until one day they are rudely awakened by finding themselves without work.

One thing it is important to mention is that electric hoists are not cheap, but then no good thing is cheap. Surely builders know this better than anybody. When comparing costs they must take into account not only the first cost but also the running cost as well. If the saving per annum given by an electric hoist over a steam hoist is capitalized, it will be found to pay for the plant many times over. This is practically true for any form of machine which is worked intermittently, otherwise why should every engineering firm of any standing in this country and abroad have adopted electric-driving?

In future every contractor for an important building should make it a point of first arranging for a supply of electricity from the nearest electric-power mains. It is no more difficult to give a supply to a building in course of erection than it is to a completed building, and electricity-supply engineers are only too anxious to increase their motor load.

A standard tramway type 25-h.p. motor, when connected to a winch through double reduction gearing, is capable of lifting 1,800 lbs. at the rate of 150ft. per minute, and it will do it day in and day out for ever without winking and at a cost of about one-third to one-half that of a steam hoist for similar service. Such a hoist is at work on the Lawyers Title Insurance Co.'s building, 37, Liberty Street, New York, the current being supplied by the New York Edison Electric Light Co.

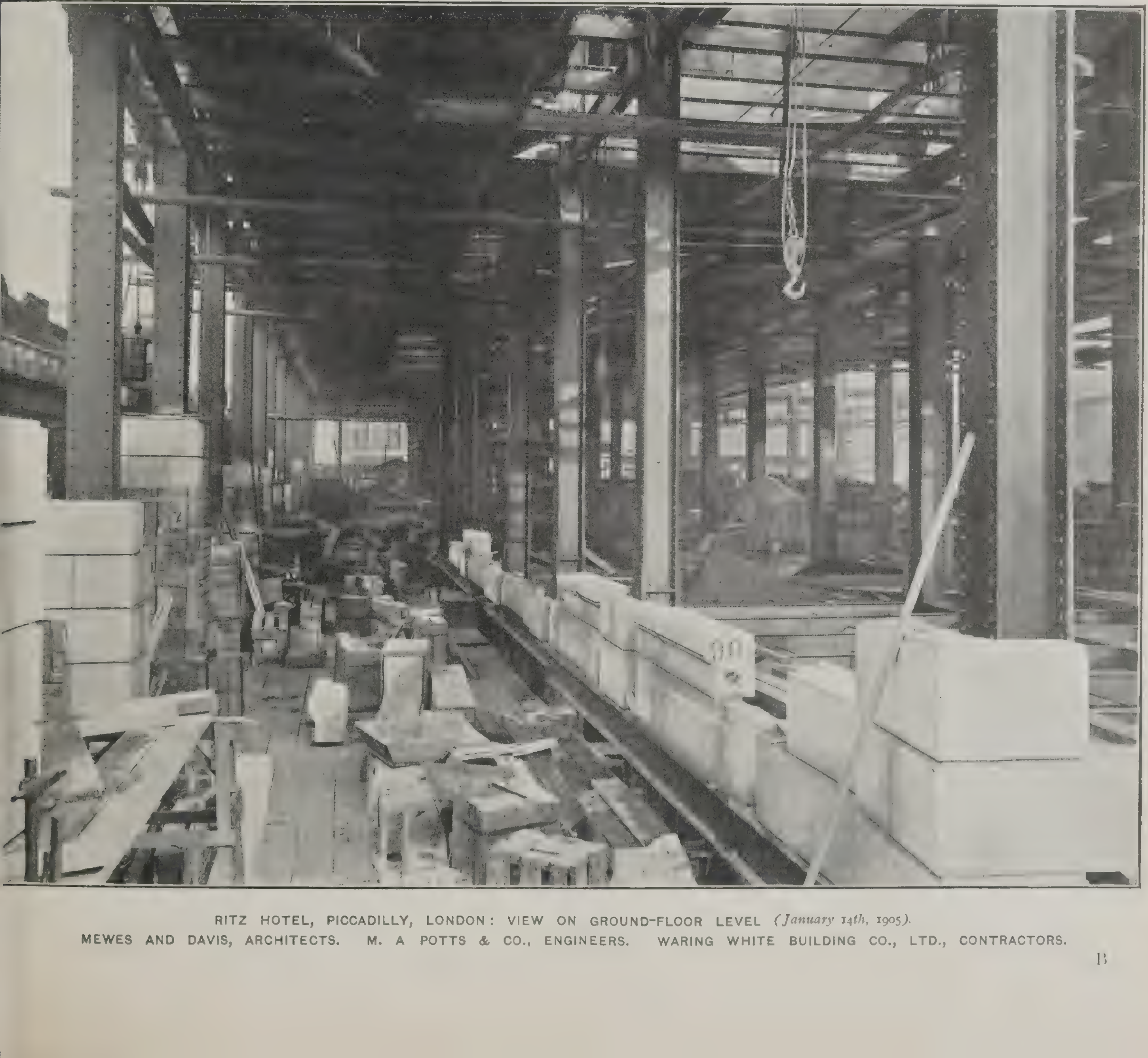
Electricity can of course be used to great advantage in other ways; thus for clearing water out of foundations a centrifugal pump driven by an electric motor makes an ideal arrangement, as they are both essentially high-speed machines, and when coupled are certain in action, take up little room, and are remarkably cheap.

Then when the time comes for finishing off the building, electric floor planers and floor polishers will save a vast amount of labour.

For carpentry work electric glue-pots are quite the thing, and in the case of a very large building there is no reason why the temporary workshop should not be electrically driven.

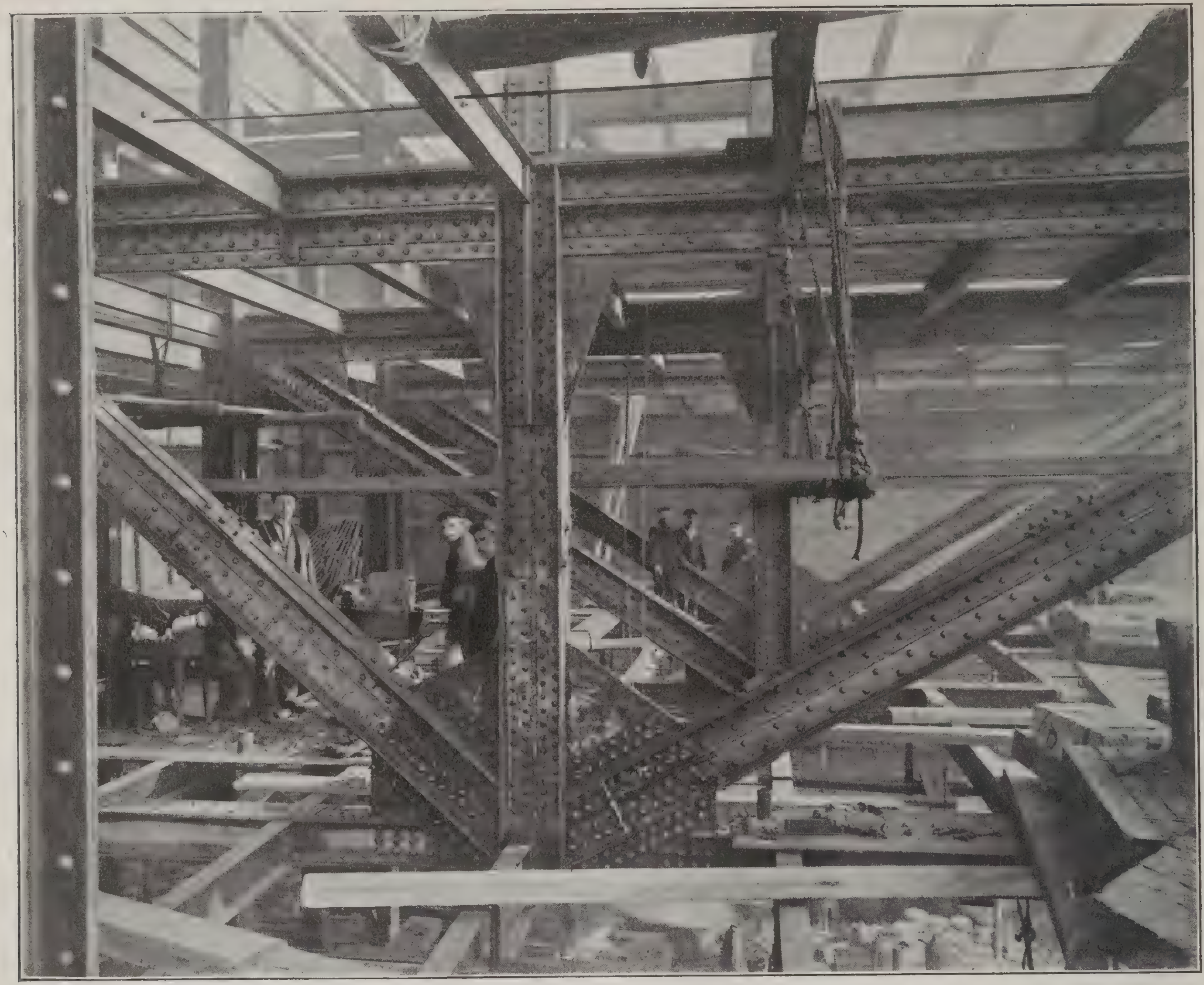
THE RITZ HOTEL.

THIS week we publish a further series of photographs showing the erection of the Ritz Hotel, next the Green Park, Piccadilly, the rapid growth of which has been the subject of keenest interest for months past. By reference to the centre plate in this issue it will be seen what a wonderful change has taken place in the erection of the steelwork since December 19th, the date on which the first of the present series of photographs was taken. The steelwork was then at second-floor level. A month later the framing for the fourth storey was completed and the filling-in of the lower floors was making decided progress. It will be noticed too that our photograph shows a pile of centerings for the ground-floor arches. Attention is also directed to the American cranes (full particulars and detail views of which were given in our issue for November 30th last): in the view taken on December 19th one of these cranes is seen reaching up from ground level; by January 14th it had been raised to second-floor level and another similar crane had been fixed on the front of the steelwork at first-floor level, for convenience in handling materials on to the floors: stonework was then being brought on to the first floor, for, as the view on this page shows, the encasing of the steelwork was well begun by that date. Turning now to the photographs taken on February 1st—about a fortnight later—we



RITZ HOTEL, PICCADILLY, LONDON: VIEW ON GROUND-FLOOR LEVEL *(January 14th, 1905).*

MEWES AND DAVIS, ARCHITECTS. M. A POTTS & CO., ENGINEERS. WARING WHITE BUILDING CO., LTD., CONTRACTORS.



RITZ HOTEL, PICCADILLY, LONDON: DETAIL OF TRUSSES OVER RESTAURANT AT WEST END.

see the steel skeleton being extensively filled in and very great progress made on the Arlington Street front; while the view taken three weeks later, namely, February 21st, shows the work reaching up to the seventh floor, the stone arcade completed, and the whole structure assuming immense proportions. The photographs indicate very clearly the general methods adopted, and we need only mention one or two matters which may pass unappreciated. Of the encasing of the steelwork we have already spoken briefly in connection with the view on the preceding page. In the centre plate the detail photograph taken on February 1st shows how the brickwork and stonework are built on to one another and tied together, and how the expanded metal (to afford a key for the plastering) is stretched across the face of the stanchion and tucked into the brickwork. The detail of the steelwork at the back of the hotel, taken on February 21st, shows one of the steel chimneys in course of erection. The photograph reproduced above is a particularly interesting one. It shows the bracing of the steel framework at the end next the Green Park. The reason for its design lies in the fact that the large room below is to be entirely free of obstructions, so that in this case the ceiling has been suspended.

In our next article we shall publish full particulars of the steelwork, with drawings of representative built-up pieces and a further series of views showing the erection of the hotel up to date. The work already done has been most instructive, but that yet to be done promises to be even more so.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Space in Lecture-room.

Havant.—H. J. W. writes: "What space per ft. super. should be allowed per person in a lecture-room?"

About 5ft. super. The London County Council regulations for theatres should be worked to in this respect.

Gallery Cantilever.

Replying to the correspondence on this subject, Prof. Henry Adams says: "The solution proposed by 'J. B.' on p. 88 of your issue for February 15th does not take account of the fact that the front or cantilever portion of the gallery will frequently have the full external load, while the back or horizontal portion has none; this will make it necessary to do all the holding down at the wall end, whence $\frac{10 \times 6}{11} = 5{\cdot}45$, say $5\frac{1}{2}$ tons anchorage capacity, as given in my reply. The weight on the column under these conditions would be $6 + 5\frac{1}{2} = 11\frac{1}{2}$ tons. When the whole girder is loaded the stress on the wall-hold is reduced, but the load on the column is increased, and to be exact the figures should then be taken as given by 'J. B.,' but I treated the question from a practical point of view, and not as an examination question. At the same time I endeavoured to show by graphic diagram the nature of the stresses induced, upon the basis of $15\frac{1}{2}$ tons on the column, as otherwise a design might have been prepared with the cantilever in two pieces, with merely a joint-plate over the column. With regard to the remarks by 'K. P.', the whole of the 4 tons *when it is there* will act in opposition to the 6 tons."

Reconstruction of Drainage System.

London.—J. E. C. writes: "(1) I have to reconstruct the drainage of a house, and owing to the sewer being very shallow in the road I have to build up piers 20ins. high in the cellar to carry pipes in order to get the required fall, namely, 3ins. in 10ft. Can the Council's surveyor compel me to fill in under the pipes with a bed of concrete, as well as brick piers 14ins. by 14ins. at every joint?—4in. L.C.C. iron drain pipes are to be used. (2) I have also to reconstruct the drainage at a house No. 1, where at present the main runs into the next house No. 2, the branches of No. 1 being connected up at the back of No. 2 and then running through into the sewer. Are the Council supposed to put the drain right which runs through the house and let me connect up to it at the back, as before, or to put a separate new connection to sewer free of charge?"

(1) Yes. Personally we should prefer the brick piers alone, as any leak in the pipes would immediately disclose its presence. But the surveyor is within his rights in ordering concrete. (2) It is a little difficult, without more precise information, to answer this kind of question offhand. If houses No. 1 and 2 belong to different owners, then the drain running through house No. 2 is a sewer from the point where the drain of No. 1 enters it, and is repairable by the authority from that point. But it may only be a "combined drain"; your letter does not state the date when this drainage was carried out, or whether it was done under an order for "combined drainage" or not.

Road Surveyor in Partnership with Contractor.

Referring to the enquiry and answer under the above heading on p. 87 of our issue for February 15th, "A Cleethorpes Councillor" writes: "I do not know what kind of a report your correspondent sent you, but the particulars in the paragraph are altogether wrong, and for the following reasons:—(1) The contractor in question has not at any time made any streets or roads for the council. (2) Any roads that the contractor has made have been for private parties who have had their own surveyor, who has supervized the works, and on completion the roads have been cut open and the highways committee have inspected the section, measured the depth of materials and satisfied themselves that the roads have been made to the council's requirements. (3) The contractor has not stated that the council's surveyor was a partner in road-making at Cleethorpes; in fact, at the contractor's last examination his solicitor stated most definitely that the contractor denied that the surveyor was or ever had been a partner (see report in 'Grimsby News' of February 3rd, 1905). (4) The true statement of the case is that up to two years ago the council's surveyor carried on a private practice, and in that capacity was engaged by the contractor to take out quantities and price his tenders; and on the contractor obtaining the work he set out the works, and there his duties ended, for the surveyor engaged by the owners of the land then had charge."

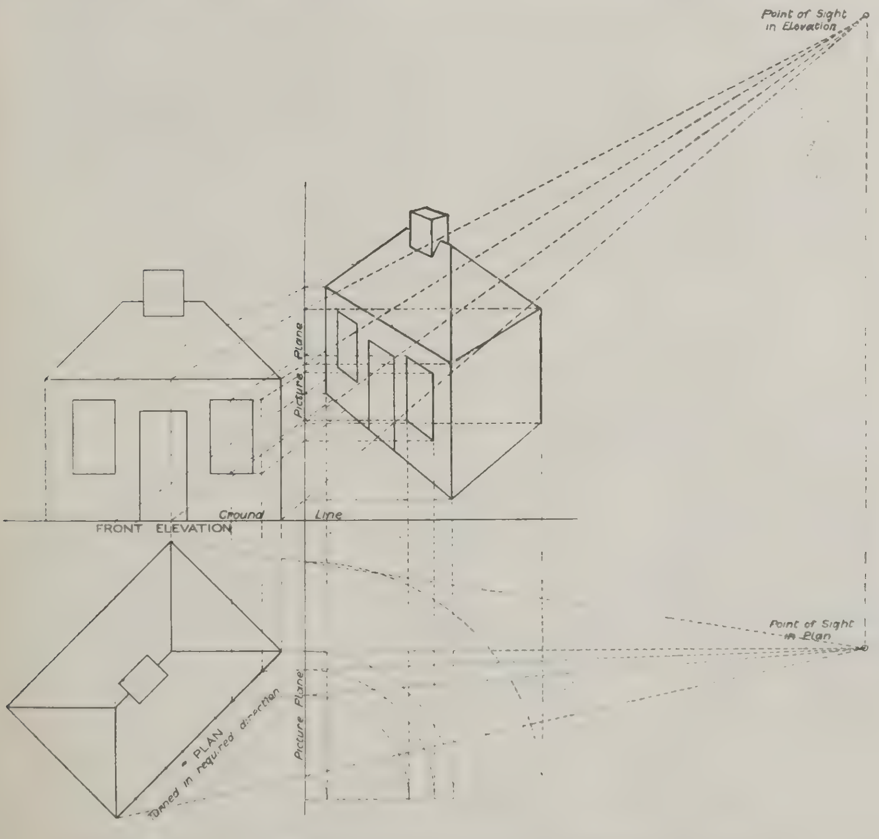
We are glad that our correspondent's letter puts such a very different complexion on the matter in question. Our previous correspondent backed his statement by a local newspaper report which he enclosed. It was obviously impossible for us to comment upon such slender corroboration.

Bird's-Eye Views.

Wood Green.—B. S. writes: "Please give the rules for a 'bird's-eye view'."

A bird's-eye view is subject to the same general rules as other perspectives, the point of sight being taken where desired. The subject may be studied from Middleton's "Principles of Architectural Perspective" (2s. 6d. nett). The diagram below shows the development of a bird's-eye view from orthographic projection. The front elevation is used to give the heights of the various parts, but the projectors to the point of sight must be drawn from where these heights would have been if the elevation had been drawn to correspond with the plan. The dotted construction lines have been shown complete for one window and the main outline. The principle is so simple that probably no further explanation will be necessary.

HENRY ADAMS.



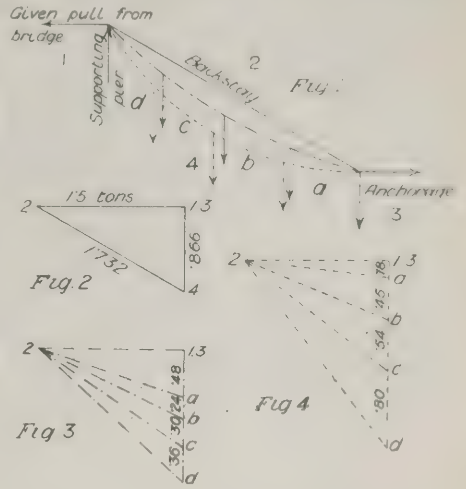
DEVELOPMENT OF BIRD'S-EYE VIEW FROM ORTHOGRAPHIC PROJECTION.

Backstay of Suspension Bridge.

Bradford.—Hydraulics writes: "Does the weight of the backstay of a suspension bridge increase or relieve the pull on the anchorage?"

The weight of the backstay of a suspension bridge forms part of the general anchorage or resistance to the pull of the suspension chains. A diagram will make this clearer. In Fig. 1 the full lines show a backstay without weight, and therefore able to be pulled straight. To the left are shown the supporting pier and the pull from the suspension chains, taken as vertical and horizontal for convenience. To the right are shown the anchorage forces, which may be taken as horizontal and vertical or by their inclined resultant. The spaces are now numbered to enable a reciprocal diagram to be set off, as in Fig. 2. Take the horizontal pull of the bridge as 1½ tons; then the horizontal pull at the anchorage will be the same, and the backstay being inclined at 30 degs. the load on pier will be ·866 tons and the upward pull on anchorage will be the same amount, the tension in the backstay being 1·732 tons. As this latter, of whatever material it be made, must have weight, it cannot remain in a straight line, but will take a parabolic curve. With only a slight dip this will be approximately the same as a circular arc. Draw an arc as in stroke and dot line, Fig. 1, divide it into any number of equal parts, marking the spaces *a b c d* in place of the single figure 4. Now for the stress diagram, Fig. 3; keep the horizontal pull 1-2 as before = 1½ tons, and from point 2 draw lines parallel to the chords of the arcs in Fig. 1, meeting the vertical from point 1 in *a b c d*. Then 1*a*, *ab*, *bc*, *cd* are the loads that must be hung on the backstay (or the weight of the backstay itself) to maintain the same horizontal pull. It will be seen that the vertical component of the anchorage is reduced, but the load on pier is increased. Now it is clear on studying the design that if we have a heavier backstay we must give it a greater dip in order not to increase the horizontal pull, proving that the weight of backstay must be taken into account, together with its curve, in designing a suspension bridge. For further proof add the dotted curve to Fig. 1, and draw stress diagram Fig. 4, showing that heavier weights must now be suspended from the chain in order to give the same horizontal pull, and it will also be seen that when the tangent to the lower end of the curve is horizontal, the whole of the vertical component of the anchorage disappears. In conclusion the short answer to the question is that the weight of the backstay relieves the pull on the anchorage.

HENRY ADAMS.



Measurement of Stonework and Woodwork.

X. Y. Z. writes: "I have a quantity of circular stone and woodwork on a job, and I understand the measurements should be taken from the sizes from which the material could be worked. The architect, however, has deducted all corners and lump waste from the measurements. Does the following clause in the 'preliminary' of his quantities save him and debar me from charging extra?—'Contractors are to accept these quantities as the method adopted by the architect, and no extras will be allowed for any different mode of measurement.' Sketches sent (not reproduced).'

If the stone corbel and the cornice over pier are each in one stone, you are perfectly correct in your contention. With respect to woodwork, it is usual to measure this nett in most cases, but a dimension of "raking cutting waste" or "circular cutting waste" is taken. It would, however, occupy too much space to go fully into the question of woodwork to cover all phases of the question. It is rather unfortunate that you have signed a contract containing a clause such as you quote. Another question is as to whether the quantities form part of the contract, or whether the price was given simply according to the drawings and specification. In any case I very much doubt, with respect to the stonework at least, whether the architect would find any judge who would give a judgment in his favour, in view of the absolutely childish incompetence displayed here. Whatever "method" may be "adopted by the architect," he is expected to show at least some rudimentary knowledge of measurement, and would hardly be allowed to screen his incompetence by such an extraordinary clause (both grammatically and in substance) as he has thought fit to insert. Had he given some indication as to the method adopted either by an explanation of his deductions, or had he referred to any local practice in which such a method was adopted, it would have been on a different footing.

W. E. D.

Value of Land in Westminster.

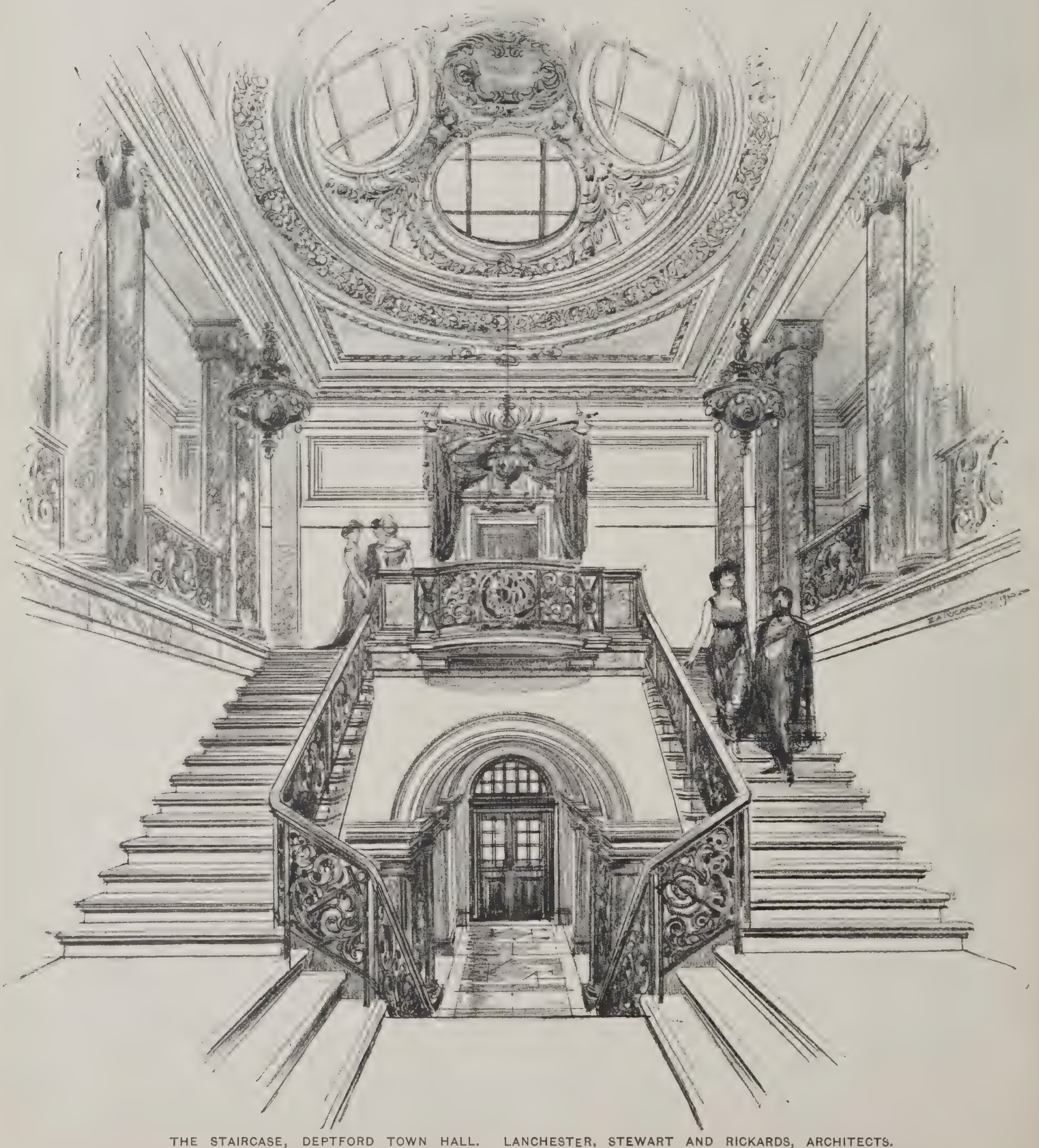
Brockley.—J. F. S. writes: "What is the approximate value of land per square foot in Westminster? The site I have in mind is a corner one of an area of about 2,500 sq. ft. and within three minutes' walk of Victoria Street."

On the particulars stated it is absolutely impossible to give any reliable information. A stone's-throw between two sites both answering the description given would frequently make a difference arrived at by multiplication. W. E. D.

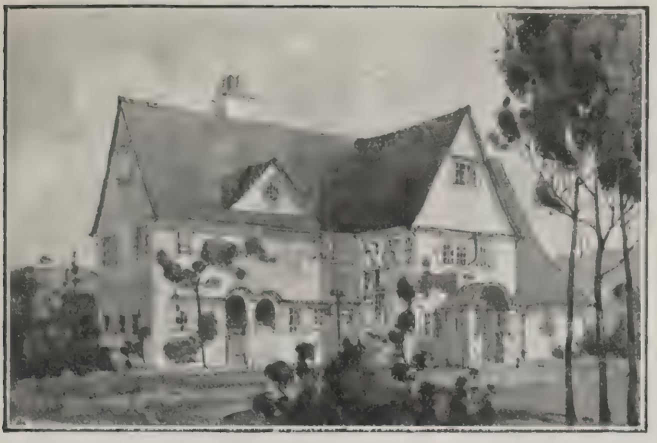
Measurement of "Fair Cutting" to Brick Arches.

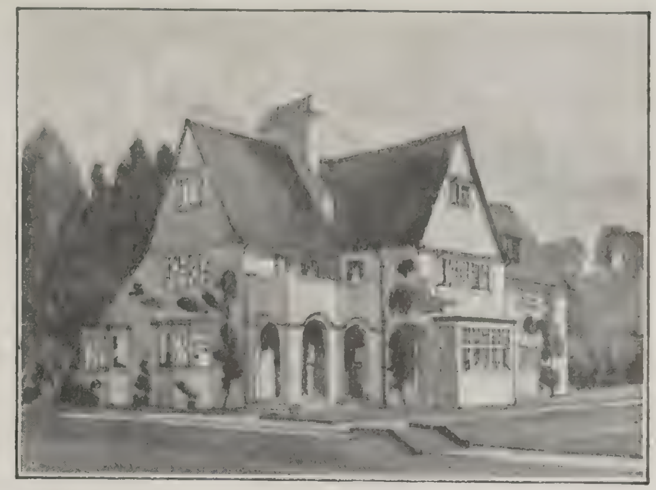
Watford.—Rex writes: "Kindly explain the method of measuring 'fair cutting' to brick arches—gauged segmental and semicircular—including skewbacks, at per foot super."

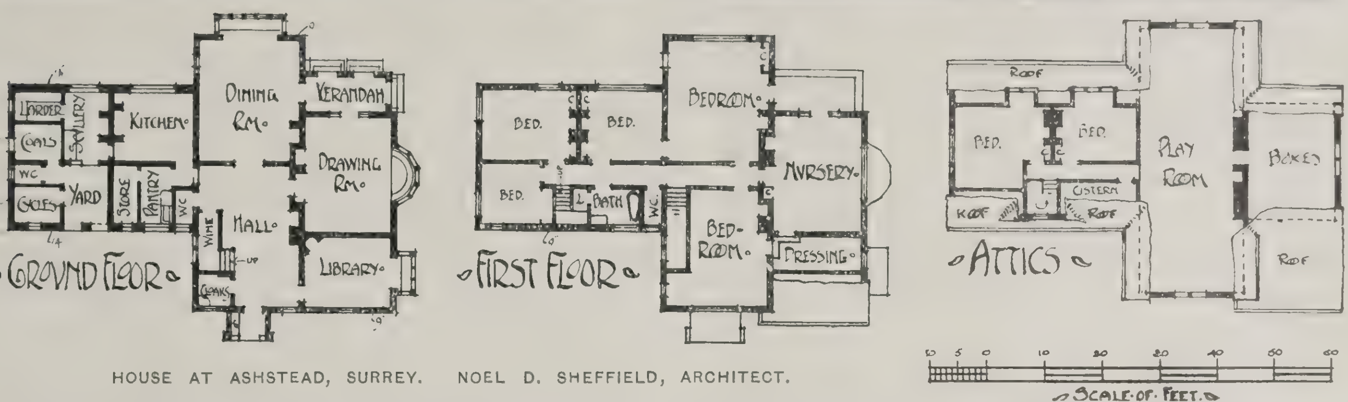
You somewhat complicate the question by practically answering it yourself, though your answer is contrary to the usual practice. "Fair cutting" in facings is usually taken per foot run, which is considered to cover $4\frac{1}{2}$ins. into the wall, any cutting beyond this being "rough." The cutting to the back or extrados of a segmental or semi-circular arch would be described as "circular cutting waste." To a flat arch there would be no cutting on the back: that to skewbacks would be described as "skewback cutting waste"; the sight length in each case being measured and the facing in which the cutting occurs (not the arches) described. W. E. D.



THE STAIRCASE, DEPTFORD TOWN HALL. LANCHESTER, STEWART AND RICKARDS, ARCHITECTS.







HOUSE AT ASHSTEAD, SURREY. NOEL D. SHEFFIELD, ARCHITECT.

This house has recently been erected by Messrs. Gathercole Brothers, of Norbury, from the designs and under the supervision of Mr. Noel D. Sheffield, of Finsbury Square, E.C. The iron casements and leaded lights and the hot-water heating were executed by Messrs. Wenham & Waters, of Croydon. External walls are white rough-casted, with stone dressings to the windows, porch, &c. The roofs are covered with red Reading tiles. All external paintwork is of a bright green colour.

THE ARCHITECTURAL ASSOCIATION.

Mr. Osborne Smith on the Sanitation of Country Houses.

A MEETING of the Architectural Association was held on Friday evening at 18, Tufton Street, Westminster, the chair being first occupied by the president, Mr. E. Guy Dawber, F.R.I.B.A., and afterwards by Mr. James S Gibson, F.R.I.B.A.

Messrs. R. Frank Atkinson, H. Bernton-Benjamin, J. A. Bessant, W. Bouser, R. W. Burrows and F. C. B. Dabbs were elected members of the Association.

The following further donations to the Building Fund were announced :—

	£	s.	d.
R. Moreland & Son, Ltd. - - -	50	0	0
E. Guy Dawber - - - - -	12	12	0
J. Howard Colls - - - - -	10	10	0
W. H. Lever (per Batsford) - - -	7	10	0
Clement Jeakes & Co. - - - -	5	5	0
A. W. Moore - - - - -	5	5	0
Thomas Broad, Ltd. - - - -	5	0	0
F. N. Reckitt - - - - -	5	0	0
Leo Sunderland - - - - -	5	0	0
L. A. Turner - - - - - -	3	3	0
A. Huntly - - - - - -	2	2	0
F. C. Mears - - - - - -	2	2	0
A. Needham Wilson - - - -	2	2	0
F. Dare Clapham - - - - -	1	1	0
Patman & Fotheringham - - -	1	1	0
Patrick Blyth - - - - -	1	1	0
	£118	14	0

Mr. J. Osborne Smith, A.R.I.B.A., then read a paper on "Country Houses and Accessory Buildings," confining himself practically to the sanitation of such buildings.

Architects, said the lecturer, should "design in beauty and build in truth," but there was no reason why the beauty of their design should be marred by truth taking the form of twisting pipes over the fronts and roofs of their buildings; for careful arrangement in planning would obviate this by placing the sanitary fittings in such positions that their necessary pipes could be fixed practically out of view and yet be quite accessible in case of need. This was more easily effected in new buildings than in old ones, yet in the latter the unsightly lines referred to could usually be modified by judicious arrangement without in any way affecting the thoroughness and efficiency of the work.

Water Supply, Cisterns, &c.

Having satisfied ourselves upon the purity and quantity of the water supply—from collecting ground, wells, or town supply—the next consideration was its storage. It might be stored in a reservoir or underground tank, which must be very carefully formed with sound brickwork upon a concrete bottom, and covered in by doming, arches or concrete and iron; the bottom being formed with rounded angles to facilitate cleaning, and the whole of the inside surface rendered and smoothly trowelled in cement. There should also be clay puddling around the outside and over the top, while the opening for access must stand well above ground to prevent surface-water finding an entry. Frequently the situation would not allow of this form of main storage tank, when it might be necessary to build a water tower and allow the water to supply the cisterns in the house, stables, laundry, &c., by gravitation, or otherwise pump direct to the storage cisterns in the buildings, which frequently meant very heavy work for the pumps, owing to long horizontal pipes. Overflows, which should be as short as possible, needed to be provided to all tanks and cisterns, and not be connected to drains.

Storage cisterns inside the building might be of lead, galvanized iron or enamelled fireclay. They should always be provided with a movable cover and be placed in a clean accessible position.

Baths.

The bathroom should be large, light and airy, with cross-ventilation, and the walls and floors formed with impervious material. If of wood, it should be covered with lead. Perhaps the nearest attempt to an ideal bath was the latest pattern independent copper bath, made of copper with roll edge and strong supports or feet; the outlet was at the end, where it should be, and not in the centre, as usual in copper baths, and had large pillar cocks and standing accessible overflow, quick waste and trap. At the end was a plate-glass screen on three sides, behind which were the various plated pipes for shower, spray, wave, douche, &c. The next best type was a first-quality white enamelled cast-iron bath, with roll edge, quick accessible waste and overflow combined, without casing, the outside being decorated in harmony with the room. Glazed fireclay was perhaps the most durable and sanitary material for baths, but owing to its great thickness a bath of this material was very heavy and required to be warmed with hot water when not in constant use.

The noise frequently experienced when the bath was emptying might be checked to a great extent by providing ventilation to the waste pipe, although this retarded the velocity of the discharge.

Speaking of pipes, Mr. Osborne Smith emphasized the importance of fixing every pipe on the surface of the walls, not buried in them. Chases were sometimes advisable, but they should be regarded as recesses in the walls and be rendered in cement or otherwise lined with impervious material to match the wall surfaces, and covered with movable casing.

The linen cupboard might, with advantage, be formed somewhere near at hand, so that the hot-water pipes might, on their way to the bath, be used to keep the linen aired by passing through the cupboard.

Water-closets.

These should not be in the bathroom, nor should access to them be from a bathroom but from a ventilated lobby common to both. Neither was it advisable to have a lavatory basin in the water-closet. The walls and floors and ventilation described for bathrooms applied equally here. Carpets should never be used, a loose mat being far preferable. A pedestal closet should be of the wash-down type, not "wash out," in one piece of fireclay or similar material, strong and neat in appearance, with accessible joints to soil pipe, and no recesses in which dirt might accumulate; the flush pipe from the cistern should discharge vertically into a socket provided at the back, without india-rubber cover, and with two gallons of water should thoroughly wash the inside of the pan and replace the whole of the contents of the trap with clean water. The larger the water area, the less liable was the pan to become foul, but beyond a certain point the contents could not be efficiently removed except by syphonic action. Closets without air-pipes and puff-pipes in the cisterns, but having a second trap, were to be preferred; the simpler the apparatus the better.

Various means for discharging flushing-cisterns for wash-down closets had been devised. Besides the simple pull, there was the push valve, to release confined air and allow the syphon action to start, or to compress air and thus drive the water over the syphon to start it; there was also the plunger, the lifting valve, lifting drum, &c. The lifting valve to start the syphon was the simplest and generally most certain in action, and was passed by most water companies.

The flushing cistern might be of cast-iron, but should be galvanized to prevent rust; lead-lined or cast-lead cisterns were best (when the water did not affect the lead), but were most costly. Porcelain was also a useful and ornamental material. The flush-pipe of lead or copper should be as straight as possible and securely connected to the arm of the pan. India-rubber covers were not desirable for this joint.

Valve closets should be fixed within an enclosure, the floor lined with lead, and the walls and all inside the enclosure painted white. There should be a large supply valve, accessible overflow, and a puff-pipe to the open air from the valve box between the valve and the trap beneath. Slop tops, formed in one piece with the pan, assisted in making a draught-proof seat.

Valve closets required a separate supply cistern containing about 10 gallons.

Overflow pipes from cisterns and floors should not have flaps on their external end, as so often advocated; they invariably became set fast, either open or shut, and were then useless.

Urinals.

In a private house these should be entirely avoided; at best they were a constant nuisance and needed every care and attention, with abundant flushing. The outlet usually supplied with them—in one piece of fireclay—was almost useless.

Urinals should never be fixed on upper floors, as, unless careful attention were given to the fixing and the waste from them, they invariably leaked and caused trouble below. The weak points were naturally the joints; therefore the fewer the better; particular attention should be given to the joint between the urinal and the trap, which should always be formed with a large brass washer, fly-nut and union having a dome grating with bayonet joint.

Housemaid's Sink, &c.

There should always be a small room, with opening window, on each bedroom floor, provided with a slop sink, which should be fitted as a water-closet, with flushing cistern, &c., connected to soil pipe, and also a sink for drawing hot and cold water. The waste from the latter should discharge into an iron (not lead) waste pipe. The combination of these two sinks in one set, so common in makers' catalogues and exhibitions, was often unsuitable for the intended purpose, because the hot and sometimes boiling water produced injurious expansion in the soil pipe, with disastrous results.

The space under these sinks should be kept free from enclosures, and every facility given to minimize the difficulty of keeping these places clean. Above all things, linoleum should never be fixed under sinks; it invariably became wet and decayed.

The main water cistern should never be placed in this room, although it was not an unusual position to find it.

Kitchen and Scullery.

This department should have preferably a north aspect, lofty, well-lighted by windows reaching to near the ceiling. The walls and floors should be of impervious material, which might be readily cleaned. The sinks should consist of one or more for washing purposes, and might be of enamelled fireclay, with wire or teak grid-tinned copper or lead-lined wood sinks—each of which had its respective merits and defects. Fireclay sinks were cleaner than the others, but were easily damaged with saucepans, and were liable to break the crockery unless the grids were used. Copper and white-metal sinks were perhaps the best, but were expensive. While lead lined were very general, they were dirty and frequently needed repair, but were less destructive to crockery. Vegetable sinks should also be provided for washing vegetables, and were best of the deep enamelled fireclay kind, fitted with plug, grating and overflow, being much more easily cleaned than others.

All sinks should be supported upon cantilevers, and the spaces under should not be enclosed, although a guard-rail would be necessary to protect the pipes and traps from injury.

Teak sinks were sometimes used for washing-up purposes, but they needed constant cleaning to remove grease, &c.

Outlets from sinks should always be formed with large cobweb gratings. The trap below should be connected to the sink with a strong brass union, back-nut and lead-washer, instead of the spigot and socket with stoneware pipe so frequently met with in the cheaper class of sink.

Larders

should have a northern aspect, with abundant cross ventilation, and be near the kitchen, but not entered direct from it. Wire gauze (preferably of copper) should be fitted to the windows and secured to wood frames on hinges. Some larders were fitted with pickling troughs, with plug and waste; these, of course, should not be connected to a drain, neither should a gulley be in the floor. If drainage from the floor was necessary, it should be formed by connecting the floor to an outlet through the wall as short as possible and discharging upon the surface of the paving outside. Shelves should be of slate, supported upon cantilevers, the walls lined with white-glazed bricks or tiles, and the floor formed with some impervious material. Personally, he preferred a slate table in the centre of the room, leaving the walls free. Larders should not be formed underground.

Pantry and Stillroom.

The butler's and footmen's pantries and the stillroom required sinks, which might be either of enamelled fireclay or lead-lined. They were usually provided with draining-boards, preferably of beech, if not covered with lead. The space under the sinks was usually enclosed; when this was done the walls and wooden sides should be painted with white enamel and a lead safe formed on the floor, turned up all round at least 6ins., having a 1in. waste-pipe discharging through the wall into the open air. This cupboard was generally used for a pail to receive pieces, tea-leaves, &c., and soon became insanitary if precautions were not taken to ensure cleanliness. Enclosures under or around any sanitary fitting invariably became nuisances, and it was preferable, except in special instances, to omit them and everything that hindered the regular cleaning of the recesses. All these sinks should have drinking water laid on from the main supply pipe.

Soil Pipes.

These were usually of cast-iron or drawn lead—cast-iron made in 6ft. lengths, either coated with Dr. Angus Smith's solution or galvanized; the latter being most suitable when the pipes were to be painted to match the rainwater pipes, because paint would not remain upon Dr. Angus Smith's solution. These pipes were cheaper than lead, less liable to damage, and more easily fixed and jointed, but they were more unsightly, and there was difficulty in obtaining a branch to exactly suit the position, and many branches meant many joints and much cutting of pipe. A cast-iron junction usually meant at least three joints, while in lead pipe only one was necessary.

Drawn lead soil pipe was made of thicknesses corresponding with those of sheet lead. The pipe whose thickness was equal to that of 8 lb. sheet lead was the strength most generally used, or for special purposes 10 lb.

Rarely would it be necessary to exceed 3½ins. internal diameter for any soil pipe, especially in country houses. A ventilating pipe was quite a different matter: for this 4ins. to 6ins. diameter might be often more suitable than 3½ins.

If it were necessary to fix the soil pipe within a building, it should be of 8 lb. drawn lead at least, but should not be buried in the wall, and if in a chase, the walls should be treated as previously described for water pipes and the casing in short lengths secured with brass cups and screws to framed grounds fixed to the walls. The most suitable place to fix a soil pipe was outside the building, in which case it should be arranged in such a manner as to be as unobtrusive as possible. The method usually adopted of fixing soil pipes in 10ft. lengths with three pairs of double cast-lead tacks was certainly efficient, but at the same time it was not elegant. Sometimes astragal joints or socket joints were used instead of the usual wiped joint, with disastrous results, there being insufficient solder to form a lasting connection, more especially if it were fixed with sheet lead tacks fixed 6ft. apart. How could this be remedied? One way he had found very successful was to have strong pipe in, say, 6ft. lengths, to agree with the rainwater pipes, which might also be of lead and fixed to walls with extra strong lead strips wiped on to the pipe at the joint and covered with ordinary sheet lead ears, the joints being "wiped" in the usual way, with a small astragal attached to the pipe above and below the joint. By this means the pipe was securely jointed and fixed, and, except to the initiated, was similar in appearance to the rainwater pipes.

They were told that an "anti-syphonage pipe" was necessary to preserve the seal of the closet trap. Quite so, but in the majority of country houses anti-syphonage pipes were not necessary, there being only two principal floors as a rule. Perhaps in one or two instances it might be necessary, but it need not occur upon the principal elevations in a carefully-planned building.

Soil pipes now invariably discharged direct into the drain, and the upper part was continued above the roof of the same to greater diameter, with a simple open end protected by a stout copper-wire balloon. Cowls had been proved by experiment and practice to have few, if any, advantages over open ends, as these pipes frequently acted as inlets as well as outlets. The less obstruction there was to check the current of air the better.

Boiling water should be carefully excluded from lead soil pipes, otherwise the undue expansion would split or tear apart the lead at the junctions between the branches and the main pipe.

Waste Pipes

from baths, lavatories, sinks, &c., not being slop sinks, should always discharge into gulleys in the open air beneath the grating but above the water. This was very important, as many by-laws required them to discharge into a channel 2ft. from the gulley. A more objectional arrangement it was difficult to imagine. He hoped before long to see the provincial authorities follow the example of the L.C.C. and eliminate this undesirable by-law.

Waste pipes, if more than a few feet long, needed to be of some material which was not easily damaged by hot water. Wrought-iron with screwed joints or cast-iron with caulked joints were most generally in use, although the short lengths referred to previously and short branches might be—and in fact were — preferably of lead. The expansion of iron pipe, if connected directly to a lavatory basin, &c., was very likely to damage the fitting.

Wrought-iron pipes were expensive and more liable to rust than cast-iron, which was cheaper and stronger and allowed a little play at the joints. In course of time the joints would probably need recaulking if the stack was very long and had very hot water frequently passing through it.

Cast-iron pipe lined with lead had been referred to in one of the latest books as the best for all purposes. Mr. Smith, however, pointed out the difference in the expansion of the two metals, observing that while the lead would "creep" under the heat and could not bulge outwards because of the iron coating, it was forced inwards, with the result that the pipe was practically choked.

Waste pipes generally might be considered similar to soil pipes as regards fixing, &c., but they should discharge into a gulley near the foot (which in certain positions should have an air-tight cover and be ventilated at a convenient position away from windows, &c.). The upper part should be carried above eaves and windows, and the traps of each fitting should be protected by a puff-pipe, brought under the basin top to the face of wall outside; this puff-pipe, besides protecting the trap under the fitting, acting as an overflow in case the vertical pipe without heads was temporarily blocked.

The traps should be of strong Anti-D cast-lead type, with screw cap for cleaning and a short length of lead connected to the iron pipe with brass tailpiece and caulked joint outside.

Traps from lavatory basins should be of 1¼ins. diameter, while those from the bath and sinks, except scullery sink, should be 2ins. diameter, and the scullery sink 3½ins. to 2ins.—that was, 3½ins. at inlet, to receive a large cobweb grating.

Drains.

The choice between iron and stoneware drains was generally determined by the nature of the ground and surroundings and the relative positions of the house and drain. On a bad foundation, when passing under a building, or if the drains were near the surface, iron pipes, possessing greater strength and having fewer joints, were less liable to damage, but the inside was not so smooth, nor did it resist acids to the same extent as glazed stoneware. A well-laid stoneware drain, with clear bore bedded upon and protected by good cement-concrete with carefully-made cement joints, was much more self-cleansing than an iron drain. The cost of drainage was practically the same whichever kind of pipe was used, less concrete being required for the iron pipes.

Fall was an important factor in drains—1 in 30 (or 4ins. in 10ft.) was most suitable for a 4in. drain, and 1 in 40 (or 3ins. in 10ft.) best for a 6in. drain. Excess of fall was quite as unsatisfactory as too little.

Gulleys.

All gulleys should be bedded in cement-concrete, fixed as near the surface of the ground as possible, and covered with a 3½in. dished York stone to receive grating. When it was necessary to keep the gulley low down, a chamber 12ins. square (inside dimension) should be formed of 9ins. brickwork in cement, smoothly rendered and brought up to receive the dished cover stone at surface of ground. It was essential that these extensions, and in fact the whole system, should be watertight. Deep chambers over gulleys were not desirable.

Circular gulleys (and square ones, by the use of an adapter) were sometimes brought to the surface with 9ins. diameter stoneware pipes, in which case the pipes should be surrounded with concrete. It was advisable to have all ironwork, except iron drain pipes, &c., galvanized, to protect them from rust. It was sometimes held that the galvanizing soon perished; but Mr. Smith said he had not experienced any inconvenience in that respect.

A flush tank, when connected to the scullery gulley, was very useful for breaking up and driving the grease through long drains. Sometimes the bath waste was arranged to effect this object. The gulleys should be of the self-cleaning, deep-seal type, with 10in. grating. Those used for surface drainage only should be made deep, to retain the grit, &c. When a waste pipe discharged some little distance from a gulley it was often advisable to fix an access shoe at the foot and carry the drain to the inlet of gulley underground. This shoe should have a stone cover similar to those used for gulleys, and a galvanized iron plate let in instead of the grating, to keep out leaves, stones, &c.

So-called grease traps were ineffective, as well as very offensive and dangerous contrivances.

Chambers, or Manholes,

should be placed at intervals in the drainage system, at bends, junctions and at points of disconnection; also in straight runs of considerable length, at least over 60ft., to facilitate sweeping, &c. The chambers should be formed upon a 6in. bed of concrete, with 9in. brick walls, smoothly rendered inside to underside of cover, the bottoms formed of white-glazed channel with three-quarter channel branches, and brick-on-edge placed vertically along the main channel and benched up to an angle of 30 degs., to offer as little facility as possible for lodgment in the event of a temporary stoppage, and also to give a secure foothold, which a steeper angle did not give.

The portion not enclosed by the iron cover should have 3in. York stone firmly bedded in cement. The size of these chambers depended upon their depth. A shallow chamber—that was, up to 2ft. 6ins. deep—should be as nearly the size of the iron cover as was consistent with the number of branches it received, while deeper ones should be about 2ft. 6ins. wide and at least 3ft. long, to give a man room to work in them.

Mr. Smith said he had not advocated iron chambers even when iron drains were used, because he was of opinion that it would be a long time before we were able to find anything better than the chamber of rendered brickwork and white-glazed stoneware channels. Iron chambers were simply inspection bends or junctions; it was difficult to make the covers watertight, and they were difficult to open, especially when it was necessary to remove an obstruction. They were sometimes useful inside a building at the top end of a branch where the drain was shallow. These iron chambers still required the brick chamber, which should be rendered, and an iron cover for access, so that there was little or no advantage in using them.

Chamber Covers

were of various types, those with a condensation seal being undoubtedly the best, especially when inside a building.

Locking covers, except in certain exposed positions, were not necessary. Covers should have eyelets for hooks, instead of hand holes, and be strong and heavy. Locks and bolts only became corroded, rusty or broken, and were then useless. Hinged covers were always a trouble, and were going out of use.

Ventilation of the system should not be forgotten. Soil pipes usually provided the necessary outlets, but they were not sufficient alone in all cases. The idea that two or more pipes taken from different branches to above the roof would secure efficient ventilation was erroneous.

Rainwater Drains.

When the rainwater drain was treated separately from the soil drainage there should not be gulleys at the feet of rainwater pipes, but, instead, stoneware or iron access shoes with cover stone and plate, to prevent surface-water or other undesirable matter finding its way to the rainwater storage tanks. Otherwise the drains should be constructed similar to soil drains. They were usually of 6ins. diameter, with 4in. branches to a single down-pipe.

Rainwater Storage, &c.

Rainwater, especially when gathered in the country, was fairly clean, and if filtered and stored in suitable receptacles was a great acquisition, more particularly for washing purposes. It was best, whenever possible, to collect and store the rainwater as near the roof as practicable, thus saving expensive pumping machines and underground drains and tanks. Needless to say, a large overflow was essential to prevent flooding in time of heavy storms. When stored underground, the tank or reservoir should be similar to that previously described when considering water-supply and storage, with the addition of a filtering chamber.

Purifying Rainwater.

There were two means generally adopted for removing many of the impurities such as soot and roof washings from rainwater. The separator, which allowed the first portion of the water to run to waste and then by a rocking motion passed the remainder to the storage tanks, was effective, but, of course, there was waste of water, which in a dry season was a consideration; while a filter composed of broken bricks, ballast and sand was most useful, but needed occasional cleaning. Some favoured a small settling chamber divided from the filter by a brick wall built with half a dozen courses, dry at the bottom, giving upward filtration, thus avoiding to a great extent choking of the upper surface of the filter, as in the case of downward filtration. All the tanks needed an overflow, but this should not be connected to the soil drains.

Land Drains.

When the subsoil of the site was surcharged with water it was advisable to conduct it away from the building as much as possible. This was accomplished by means of agricultural drain pipes laid without joints a short distance apart in trenches, and covered with ballast or brushwood to within a foot or so of the surface, and topped with ordinary garden soil or mould.

Rainwater or subsoil-water should be excluded from soil drains if the sewage was to be treated either by chemical or bacterial processes, otherwise unnecessary expense would be incurred by the increased volume to be dealt with.

Stables.

The floors of stables should be of hard impervious material, with as few joints as possible, and currented to fall to a channel just outside the stall divisions, which discharged either through the wall into a gulley or into an open end in the channel and thence to a gulley outside. This open end was a small pit formed with a white-glazed channel bottom and cement sides; the pit was made large enough to receive a galvanized cast-iron perforated bucket to catch straw, &c., and was covered with a heavy hinged cast-iron grating. It was often desirable, however, to provide a shallow channel with a cast-iron cover, let in flush with the

ROMAN AQUEDUCT, ALGERIA.
This fine specimen of Roman work is about three miles south of the wonderful city of Constantine. It is more than 60ft. high, and the five arches are in an excellent state of preservation. The photograph was taken by Mr. Charles M. C. Armstrong, of Warwick.

paving, and with similar branches to the centre of most of the stalls, to prevent the straw becoming wet. Loose boxes usually had the open end before described in the centre continued to the gulley outside.

Every channel and drain in a stable needed to be easily accessible for cleansing and sweeping, and there should be no gulleys inside the buildings.

The manure pit should have hard impervious walls and floor, the latter currented to an outlet pipe discharging through the wall into a gulley. These gulleys should be self-cleansing, but required a galvanized perforated bucket to catch straw, &c.

Besides stalls and loose boxes for carriage horses, hunters and cart-horses, there was usually a sick box. This should be quite apart from the others and have a separate drain from it. The washing space should have a deep yard gulley to retain the grit from washings, &c.

If there was a shoeing forge a drain from where the horses stood should not be forgotten.

Drains from stables, cowyards, piggeries, &c., should always drain into a liquid manure tank carefully built in brickwork in cement and rendered watertight, having a rounded bottom to facilitate removal of sediment. There should be a pipe from ground level to about 1ft. 6ins. from the bottom, into which could be dropped the suction pipe of a pump attached to a manure cart. The liquid manure could then be carted to the fields or gardens where required. These underground storage tanks should also be provided with an access hole in their crown, and an overflow to carry off an excess which might accumulate in time of storm from surface-water gulleys, &c., and might be connected to the main drain from the house to the filter beds, &c.

An ample supply of water was important for the stables, but it should be distinct from the house supply. A cistern in the loft or clock-tower, to which the men could pump water, was a great convenience, and a hose could then be used for washing horses and carriages. One or two sinks were necessary in the harness-room or in a small room adjoining, with hot and cold water laid on to them. If a suitable grate with a boiler were fitted in the harness or mess room an ample supply of hot water could be provided for these sinks, which would be found very useful for various purposes.

Cowhouses.

Each division in a cowhouse accommodated two cows, and a wide trough was formed just outside the heel-post. This channel and the dunging passage should be formed of an impervious material with grooves to prevent the cows slipping, and in the centre of each division should be an open end similar to those in the stables, conducted to a gulley outside. The space where the cows stood should be level, and formed of well-rammed chalk or clay. Calving boxes were treated like loose boxes, with an open end in the centre discharging into a gulley outside. Calf-pens usually had an open channel discharging over a gulley. Pigsties should discharge through a pipe into a wide channel outside the sties, and be conducted to a gulley with basket before entering the drain.

Dairies

should be in a cool sheltered position within easy distance of the cowsheds and well-ventilated. Near at hand should be the dairy scullery, with sink, hot and cold water laid on, and paved floor currented to a pipe through the wall discharging on to a gulley, not inside the building, as was frequently the case.

Disposal of Sewage.

The sewage when it arrived from the house and buildings might be treated in various ways, but time would not permit of a description of them all. One very simple and effective method which had proved quite satisfactory in dealing with this class of sewage might, however, be briefly described. The sewage from a large country house with stabling for forty horses and accommodation for twenty cows, after leaving the disconnecting chamber, was first retained in a large watertight settling tank, covered over similarly to the old-fashioned cesspool, except that the inlet and overflow were turned down, thereby, among other reasons, preventing the scum finding its way into the drains. The tank was capable of holding at least one day's flow of sewage. The overflow was discharged upon the surface of a long open-air filter situated in a meadow, and composed of broken bricks, clinker, &c., finished with smaller local material on top. The sewage was distributed over the surface of the open-air filter by channels or a sprayer and allowed to percolate through 4ft. to 5ft. of material, when it reached a layer of land drain pipes at the bottom which conducted the effluent to the end of the filter and thence to the land or ditch. The effluent was colourless and odourless. The water in the ditch which received it was foul and a nuisance before the introduction of this form of filter; after the filter had been in use about three years it was quite sweet and wholesome.

A discussion followed.

IN PARLIAMENT.

(By our Press Gallery Representative.)

ON February 22nd Mr. Wylie, the member for Dumbartonshire, who takes a considerable interest in the amenities of the House of Commons, asked Lord Balcarres, representing the First Commissioner of Works, what had been done during the recess for improving the ventilation and sanitary arrangements of the buildings, and what, if anything, remained to be done to fulfil the recommendations of the committee's report on the subject.

Lord Balcarres stated that during the recess the recommendations of the Select Committee of the House of Commons with reference to the ventilation had been carried into effect, with the exception of the completion of the extract fan. This had been delayed by reason of structural difficulties incidental to the floor of the Commons lobby chamber, but it was expected that this fan would be running within a month from date. The principal improvements already effected were (1) the complete washing of the air by means of a new type of water screen, (2) the erection of a much more powerful intake fan, (3) the more effective isolation of passages joining the main airways. This would be followed by experimental tests having in view the better distribution of air to the Chamber, and also by tests of the air so distributed. It was hoped that the works already completed would result in a very considerable improvement in the quantity and quality of the air-supply.

Replying to Mr. Whitmore on February 17th, Mr. Arnold-Forster, the Secretary for War, stated that the question of the disposal of the site of the Government's military school at Chelsea could not be definitely decided until the provision of accommodation for the school elsewhere was further advanced.

Lord Balcarres has promised to satisfy the curiosity of hon. members by having placed in the tea-room of the House of Commons plans showing how the opening of the Mall into Charing Cross will be carried out, along with drawings of any architectural features that are to form part of the general design.

Lord Balcarres informed the House that a path 65ft. wide was being made from the Victoria Memorial to Piccadilly. It would have a grass border of 15ft. and would be planted on either side with a double avenue of trees. It was not intended to make a road now or in the future.

A petition praying to be heard in committee against the London Building Acts Amendment Bill has been presented by the District Surveyors' Association (Incorporated), London.

Mr. Henry Hobhouse asked the President of the Local Government Board if he would lay before the House a return of the building by-laws made by rural district councils which affect the construction of cottages, and if he proposed to have any enquiry into the subject.

Mr. Long replied that he was afraid that looking to the differences in detail between various series of by-laws it would scarcely be practicable to indicate each area by means of a return. He was receiving representations from various quarters, and the whole question was engaging his attention. He had not at present arrived at a decision with regard to the course to be adopted in the matter.

Keystones.

Mr. H. H. Richardson, of 2, Broad Street Buildings, E.C., has been appointed solicitor to the Society of Architects. He is an honorary member.

Another new Leeds Church.—In Holbeck, Leeds, the new Church of St. Edward is being completed, Mr. G. F. Bodley, R.A., being the architect. The cost will be £30,000.

New Midland Station, Sheffield. — The greater portion of the new frontage to the Midland passenger station, Sheffield, will be completed shortly.

The Tallest Residential Dwellings in London are Queen Anne's Mansions, situated near St. James's Park. These were erected in 1876 and comprise fifteen storeys, reaching to a height of 180ft.

The Gaiety Theatre Design.—Mr. A. T. Franklin, as arbitrator between the London County Council and the Gaiety Theatre Co., has fixed £17,217 as the increase of cost to be paid by the Council for the added embellishment of the new Gaiety Theatre. The company claimed £28,000.

L'Architecte Français.—On the occasion of the first visit he paid to London, M. Redon, the French architect, remarked: "London is wonderful. C'est grand, c'est beau, c'est digne—comme un policeman! I was never so struck by London as when I got back to Paris, the streets of which looked très coquet, mais articles de Paris."

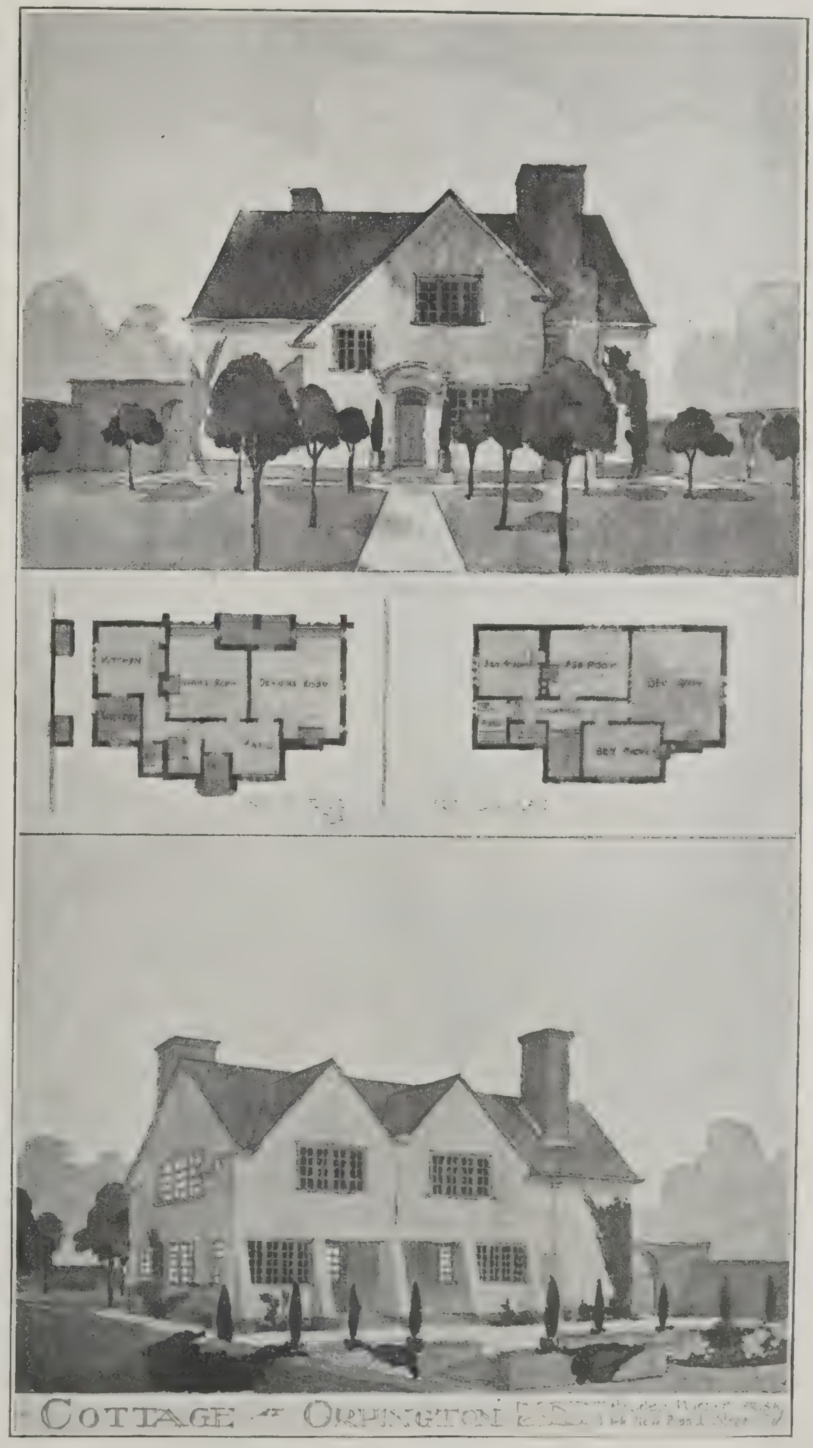
Northern Architectural Association.—At the recent (fourteenth) annual social gathering in connection with the students' sketching club, Mr. A. B. Plummer (secretary of the Association), on behalf of Mr. W. Glover, past-president, asked the Association to accept a presidential chair of oak and green leather, with the arms of the Association carved upon it. Mr. Plummer spoke warmly of the generosity of Mr. Glover, whom they had to thank for the travelling studentship, for the presidential badge, and for the new premises they were about to occupy. During the evening the president, Mr. J. Walton Taylor, F.R.I.B.A., distributed the prizes, the Glover medal and travelling studentship being awarded to Mr. G. S. Twizell.

The Future of Birmingham was the subject of a paper which Mr. William Henman, F.R.I.B.A., read before the last meeting of the Birmingham Architectural Association. After giving his impressions of Birmingham on his first visit thirty-three years ago—for Mr. Henman was born in London — he observed that there was still ample room for improvement. There had been too much self-gratification displayed since Birmingham was called the best-governed city in the world. Mr. Henman asked his hearers whether, from an architectural standpoint, Birmingham had kept reasonable pace with its prosperity. The new Corporation Street might be made an ornament to the city or the very opposite. He regretted that the street was begun under the Workmen's Dwellings Act rather than as a street improvement. The line adopted for it was by no means the best available. Many of the streets crossed at awkward angles, and the older streets were damaged as business thoroughfares. They should be thankful for its construction, however, in that it had provided an airy thoroughfare and had given character to the city. Mr. Henman, by the aid of maps, illustrated the inconvenience caused by the lack of through streets. He suggested improvements between Paradise Street and Five Ways; and on land between the Prince of Wales Theatre and Easy Row, in the neighbourhood of the Crescent, he saw a site for the new cathedral, clergy house and other public buildings. Ready communication could be obtained between the centre of the city and Bordesley by a continuation of New Street.

New Council Offices at Cleethorpes have been erected from designs by Mr. H. C. Scaping, architect, of Grimsby, and Mr. E. Rushton, town surveyor. Mr. H. Marrows, of Grimsby, was the contractor. Fireproofing flooring has been laid by Messrs. Mark Fawcett & Co., of London, and wood-block floors have been laid by Messrs. Hollis Brothers, of Leicester.

Competition for Carnegie Library at Townhill, Dunfermline.—The Carnegie Dunfermline Trust have accepted the designs of Mr. Peter L. Henderson, Edinburgh, and have awarded the premiums of £25, £15 and £10 to the three designs considered next in order of merit, namely, those of Messrs. James T. Scobie, Dunfermline; Henry F. Kerr, Edinburgh, and Kerr & M'Culloch, Alloa. More than sixty designs were received, six of which were submitted to Messrs. Morham & Gardiner, of Edinburgh, who estimated the cost of each. The building is to cost £3,500 and will provide a library for 4,500 volumes, as well as reading, recreation, billiard and smoking-rooms.

Edinburgh Architectural Association. – At the recent annual dinner of this Association Mr. Crabb Watt, K.C., glanced at what had been done during the past thirty years to preserve the charm of the ridge from Holyrood to the Castle, and to promote throughout the city symmetry of outline, ornamentation of elevation, and the breaking-up of skylines. The principal blot was probably the horizontal roof of the Caledonian Station, while the design of the North British Railway buildings would perhaps have been better if it had been Gothic, with a tower like the Marischal tower in Aberdeen. If the Association exercised more authority and was able to assert its views more forcibly they might possibly prevent the demolition of a not untasteful structure in the Synod Hall and the waste of money which could go to the beautifying of a hall on a vacant site. He instanced the National Portrait Gallery in



P. MORLEY HORDER, F.R.I.B.A., ARCHITECT.

This cottage is built with hollow brick and rough-cast walls, red brick chimneys and red-tiled roof. The contract for the whole was £515. The internal fittings are simple but the best of their kind.

Queen Street as one of the best types of architecture that had been seen in this country for the last twenty years; while "The Scotsman" buildings in mass, symmetry and decoration were unequalled in the Kingdom. During the evening Mr. Hunter Crawford, on behalf of the members, presented Mr. William M. Page (who is removing to Glasgow) with several volumes of standard works on architecture, in recognition of his services as secretary of the Association for the past four years.

The New Exe Bridge is nearing completion.

King's College Hospital.—The selection of the design for the rebuilding of this hospital on a site at Camberwell will probably be made in April or May. Six architects are competing.

Mr. H. Stuart Jones, director of the British School at Rome, will be leaving for England on March 6th, and is then giving up his position. The name of his successor has not yet been made public.

Competition for a Clock Tower.—Architects within twelve miles of the site of the obelisk in St. George's Circus, S.E., are invited to submit designs for the clock tower which is to take the place of that monument. Messrs. Thompson & Pomeroy, 49, Hill Road, Wimbledon, have been appointed advising architects and assessors. Designs are to be delivered to them on or before March 31st. Premiums of £20, £15 and £10 are offered.

The Phœnix Fire Office, Leeds, now being erected from designs by Mr. W. H. Thorp, was visited last Saturday by the students attending the classes in building construction at the Leeds Institute. These classes are held on Monday, Wednesday and Friday evenings throughout the session (from September to May), and number 176 students. Last session the examination successes were over 84 per cent., which is excellent. Mr. James Neill is the instructor.

Leeds and Yorkshire Architectural Society.—Mr. Maurice B. Adams, F.R.I.B.A., read a paper on public libraries before this Society last Thursday. After dealing briefly with the history of the subject—mentioning the famous "Record Office" at Kouyunjik founded more than twenty-five centuries ago, the library of the great temple at Nippur (discovered four years ago by Dr. Peters, of New York) carrying back Babylonian civilization to 7,000 B.C., and the great library of Pergamon, founded 200 B.C., with 200,000 volumes—Mr. Adams spoke of modern conditions and the stern realities of the "penny rate," which was fixed more than fifty years ago, though any town could now, by special Act of Parliament, augment its penny rate for library purposes, and twenty-eight boroughs, with satisfactory results, had done so. Mr. Adams said he thought that the Board of Education should have powers to include library enterprise when making grants for educational purposes. The system of State aid for libraries obtained in Canada, Australia, South Africa and the United States. The central library at Boston, U.S.A., cost £473,000, and contained 800,000 books, with ten branch libraries besides, averaging 20,000 volumes each: the yearly cost of maintenance was £52,000, out of which the city purse provided £47,000. Mr. Adams proceeded to deal with the planning of a public library, observing that according to the usually accepted *regime* in proportioning the floor area, with a closed lending department, the following allocation of space for every 10,000ft. super. had been recommended, 3,000 sq. ft. for newspapers, 2,000 sq. ft. for magazines, 2,000 sq. ft. for the reference department, leaving 3,000 sq. ft. for the lending library.

A Prize of £20 for a Lectern in Hardwood is offered by the Carpenters' and Joiners' Companies, who will hold an exhibition of works in wood next June.

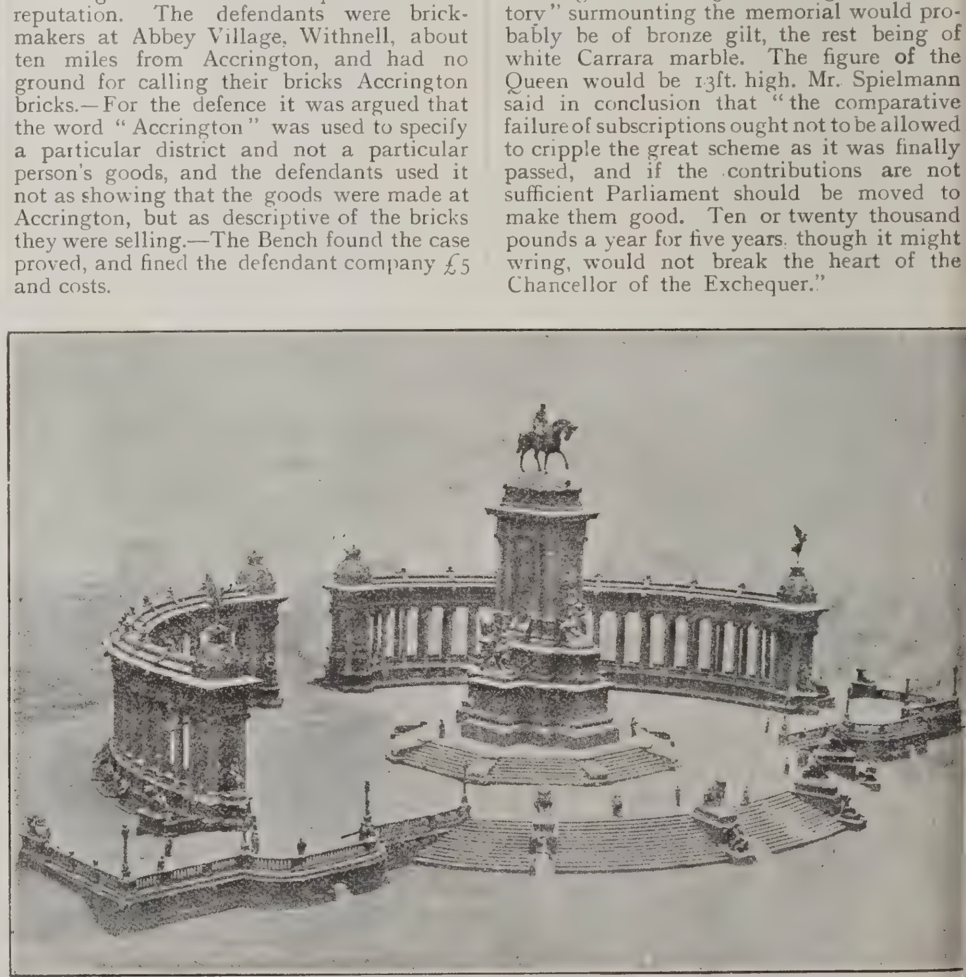
Sheffield Society of Architects and Surveyors.—At last Thursday's meeting of this Society a paper on "The Curvilinear Period of Gothic Architecture" was read by Mr. Mitchell-Withers. The terms under which this period was known by different writers were briefly enumerated, such as "late Decorated" and "the flowing period," but Mr. Mitchell-Withers considered that Sharp's term of "the curvilinear period," dating from 1315 to 1360, was the most satisfactory. The lecturer then proceeded to deal with his subject in detail.

Law Cases.

Accrington Facing Bricks. — At the Chorley Police Court last week Mr. Jonathan Booth, sales manager of the Accrington Brick and Tile Co., Ltd., summoned the Withnell Brick and Terra-cotta Co., Ltd., under section 2 of the Merchandise Marks Act, 1877, for unlawfully applying the words "Accrington facing bricks" to certain bricks made by them. The plaintiff company, said counsel, was established at Accrington fifteen years ago, and there were upon the same field, or within a radius of a mile, three other brick companies, who also manufactured what were known as Accrington bricks. The other companies were the Enfield Brick and Terra-cotta, Whinney Hill Plastic, and Huncoat Plastic Brick and Terra-cotta. The four companies were all within the postal, telegraphic and telephonic area of Accrington, and the plaintiff companies had during the period mentioned spent enormous sums in advertising bricks manufactured on the Accrington brickfield, and "Accrington bricks" had acquired a wide reputation. The defendants were brickmakers at Abbey Village, Withnell, about ten miles from Accrington, and had no ground for calling their bricks Accrington bricks.—For the defence it was argued that the word "Accrington" was used to specify a particular district and not a particular person's goods, and the defendants used it not as showing that the goods were made at Accrington, but as descriptive of the bricks they were selling.—The Bench found the case proved, and fined the defendant company £5 and costs.

NATIONAL MEMORIALS.

At last week's meeting of the Society of Arts Mr. M. H. Spielmann read a paper on the "Queen Victoria Memorial, as compared with other Memorials Abroad," in the course of which he showed views of the memorials of Peter the Great, Alexander I., Alexander II., Nicholas I. and Catherine II. in St. Petersburg; the Empress Maria Theresa in Vienna; Gambetta in Paris; Carnot in Lyons; Alfonso XII. in Madrid (illustrated below, through the courtesy of the Royal Institute of British Architects); several of the modern monuments in Berlin; the Victor Emmanuel memorial in Rome; the great memorial building to be erected on the Maidan in Calcutta (illustrated in our issue for last week), and others. These views formed a suggestive introduction to a detailed description of the National Memorial to Queen Victoria now in progress in front of Buckingham Palace. The model of the principal monument was now being enlarged to one-half full size. But it had unhappily been quite recently decided that the funds available did not permit of the larger scheme proposed for the whole memorial being carried out. The sculptures in the processional road were to be suppressed, and as the Colonies contributed considerable sums, the gates with the armorial decorations of arms and emblems of these Colonies, and the sculptures facing them on the side fountains, would be set up in their names. The Mall side was allotted to Australia, that on the north to Canada, the entrance from the processional way to South Africa, while of the great fountains in the quadrants that to the south-east would be in the name of West Africa and the Indian Dependencies, that to the north-east representing Newfoundland and the West Indies. The width of the chief roadway leading up to the Memorial from Charing Cross was 65ft. The figure of "Victory" surmounting the memorial would probably be of bronze gilt, the rest being of white Carrara marble. The figure of the Queen would be 13ft. high. Mr. Spielmann said in conclusion that "the comparative failure of subscriptions ought not to be allowed to cripple the great scheme as it was finally passed, and if the contributions are not sufficient Parliament should be moved to make them good. Ten or twenty thousand pounds a year for five years. though it might wring, would not break the heart of the Chancellor of the Exchequer."



MODEL OF MEMORIAL TO ALFONSO XII., LATE KING OF SPAIN, IN COURSE OF ERECTION IN THE PARK OF MADRID. JOSE GRASES RIERA, ARCHITECT.

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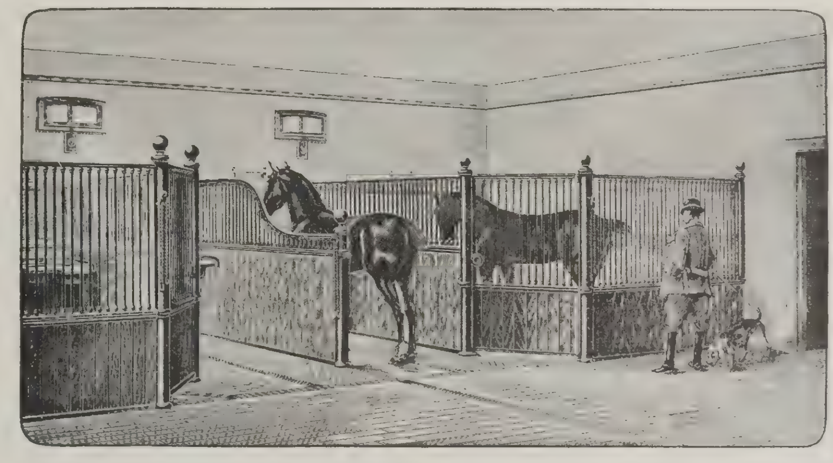

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AGENCIES, SHOWROOMS AND DEPÔTS:—

LONDON (City)—15 Upper Thames St., E.C.; LONDON (West End)—23 Princes St., Cavendish Sq., W.; LIVERPOOL—30 Red Cross St.; MANCHESTER—24 Brazennose St. & Hereford St., Ordsall Lane, Salford; BRISTOL—10 Victoria St. & 12 Welshback; NEWCASTLE-ON-TYNE—13 Prudhoe St.; GLASGOW—125 Buchanan St.; BIRMINGHAM—Guildhall Buildings, Stephenson St., & 76 Pershore St.; DUBLIN—44 Grafton St.; SOUTHAMPTON—Town Quay (The French Prison).

Electrical Notes.

Current for Power Purposes.—The Huddersfield Corporation has resolved to push the sale of energy for power purposes, and to give commission on the cost of motors to any contractor who shall arrange for the fixing of them, and has decided to distribute a sum equal to the commission upon all motors fixed *pro rata* to the number arranged by each contractor, the applications for which motors have not been handed in by any contractor.

Architects and Electric Light.—Commenting on Mr. B. R. Tucker's paper on electric and gas lighting, read before the last meeting of the Society of Architects (as reported in our issue for last week), the "Electrical Review" observes that apparently the author had nothing particularly new to state, "but it is a hopeful sign that this subject is being taken up by architects generally instead of leaving the question of lighting to the builder or contractor. Of course certain architects have made a speciality of the lighting of interiors, and we need only look at some of the latest West End theatres to see how successfully electric light has been used in order to secure the threefold advantages of good lighting, purity of atmosphere and pleasing artistic effects. We believe that many architects in matters of this sort consult electrical manufacturing firms in the drawing up of their designs and specifications; this is a practice that will always give the best results, as, although an architect has to know a great deal about some things, we cannot expect him to be conversant efficiently with everything. It is to the house-lighting question that the architect should devote more attention; and if he studies the subject and his clients at all we cannot see how he can fail to provide for the electric light."

The New York Central Railway is to be electrified at a cost of £10,000,000. The radius extends to 40 miles from New York. The electrified trains will cover all points of the road and its branches for the distance mentioned, but beyond that point the present steam locomotives are to remain in use. The new trains will be drawn by small engines weighing 85 tons each, capable of running at a regular speed of 75 miles per hour and of developing into a rate of 90 miles—a vast improvement on steam locomotion. Each engine will generate 3,000 h.p. Generating stations are to be erected 20 miles apart all along the track embraced in the electric zone, and the current will be transmitted to the engines by means of a third rail, which is to run alongside the lines over which the trains are drawn. Every precaution has been taken to safeguard human and animal life when crossing the track, it having been considerately arranged that there shall be no wagon roads or crossings on a level with the track, for where a road is met with, the track will be either lowered or raised so to pass under or over it. Trains will be run every two minutes, and the fares charged will be on a popular basis, so as to be very little higher than those charged on street cars. It is anticipated that the new system will be in full operation within the next two or three years.

New Companies.

Lower Halviggan Clay Co., Ltd., Victoria Place, St. Austell, Cornwall. Capital: £10,000.

Crateric, Ltd., to acquire the business of the Crater Cement Co. and the process for the production of cements known as Crateric and Vulcanum, 34, Old Broad Street, E.C. Capital: £5,000.

T. and M. Plowman, Ltd., manufacturers of and dealers in bricks, tiles, pipes, &c., Edmonton and Fletton. Capital: £40,000.

Matolin, Ltd., oil, colour and varnish manufacturers and merchants, builders, &c. Capital: £5,000.

James Darby, Ltd., lead and glass merchants, &c., Mill Street, Hull. Capital: £15,000.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

During the week ending February 24th twenty-eight failures in the building and timber trades in England and Wales were gazetted.

J. Ashton, housebreaker, Hackney. Adj. Feb. 17th.

Stevens & Co., builders, Southall. Adj. Feb. 16th.

C. A. Williams, builder and contractor, Bishopston, Bristol. Gross liabilities £1,427; deficiency £148.

H. Lee, painter and decorator, Leeds. R.O. Feb. 14th. P.E., Leeds C.C., March 14th, at 11.

Hards & Bradly, auctioneers and surveyors, London and Birchington-on-Sea. Adj. Feb. 17th.

Canwarden & Puddey, builders, Chiswick. R.O. Feb. 17th.

J. & J. Murphy, builders, East Ham and Catford R.O. Feb. 15th.

Benham & Baker, builders and decorators, Richmond, Surrey. R.O. Feb. 14th.

C. Pountney, retired builder, Bewdley. R.O. Feb. 13th.

J. Fuller, builder, Headley. P.E., Guildford Town Hall, March 14th, at 1.

J. T. Stevens, builder, Eastbourne. Liabilities £1,777; estimated assets £3,729; surplus £1,952.

H. Brookes, painter and plumber, Birkenhead. R.O. Feb. 17th.

E. Turner, joiner, Wakefield. R.O. Feb. 15th. First meeting, O.R.'s, Wakefield, March 2nd, at 10.30. P.E., Wakefield C.C., same day, at 11.

J. W. Bygate, builder and contractor, Rotherham. First meeting, O.R.'s, Sheffield, March 1st, at 12.30. P.E., Sheffield C.C., March 16th, at 2.

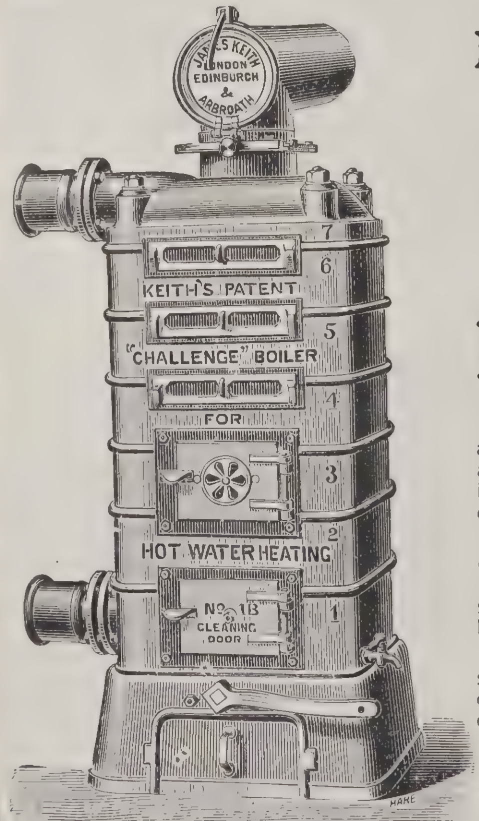
A. J. Corfield, slate merchant, Sheffield. First meeting, O.R.'s, Sheffield, March 1st, at 12. P.E., Sheffield C.C., March 16th, at 2. Gross liabilities £1,791; assets nil.

W. J. F. Andrews, builder, Tottenham. First meeting, O.R.'s, 14, Bedford Row, W.C., March 2nd, at 3. P.E., Edmonton C.C., March 20th, at 11.30.

R. J. Black, marble and stone merchant, Kensington, Acton and Strand. R.O. Feb. 13th. P.E., London Bankruptcy Court, March 29th, at 11.30.

W. H. Chedzoy, builder and plumber, Bristol. R.O. Feb. 17th. First meeting, O.R.'s, Bristol, March 1st, at 12. P.E., Bristol Guildhall, March 10th, at 12.

W. Vizzard, timber merchant, Broadway. R.O. Feb. 14th. First meeting, 45, Copenhagen Street, Worcester, March 1st, at 11. P.E., Worcester Guildhall, March 7th, at 2.



KEITH'S Patent
CHALLENGE
BOILERS
FOR HOT WATER
HEATING

Utilise the fuel to the greatest advantage even while working with a rested fire, all the heating surface being against the fire or immediately over it.

All parts readily accessible for cleaning or examination. Rapid internal circulation. Supplied in sections easy for transport or handling.

In sizes to heat from 500 to 7,000 square feet of surface; also other classes of the "Keith" Boilers capable of heating from 50 feet of 4-in. pipe to 24,000 feet.

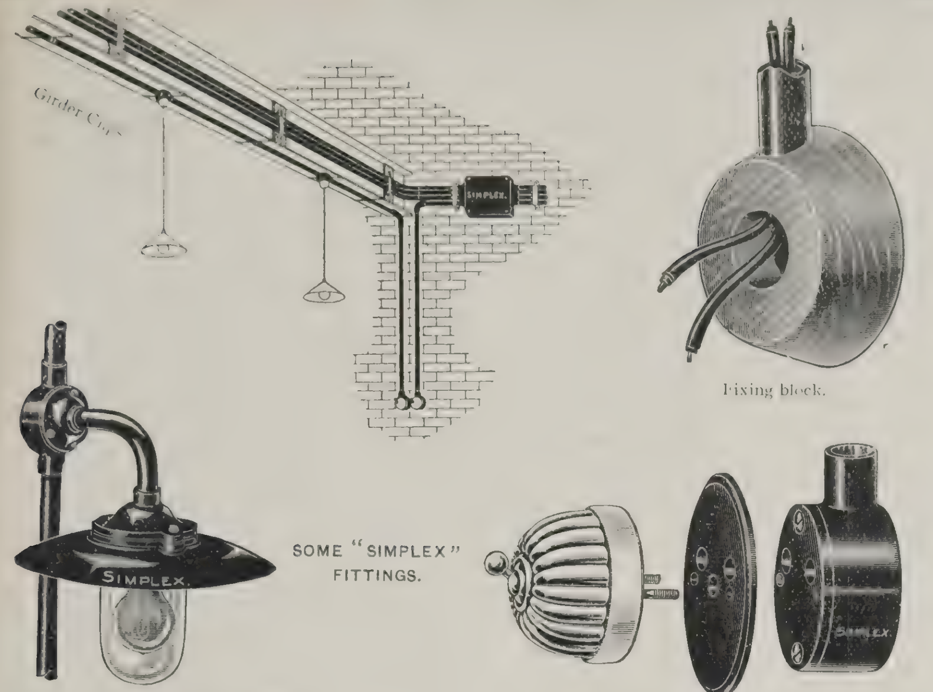
Prices, &c. on Application.

THE BLACKMAN FAN
JAMES KEITH & BLACKMAN COMPANY LIMITED LONDON

BLACKMAN
ELECTRIC or BELT DRIVEN FANS
for VENTILATING.
Over 65,000 in use.

JAMES KEITH & BLACKMAN Co., Ltd., 27, Farringdon Avenue, LONDON, E.C.
Heating, Ventilating, High Pressure, Gas Lighting, and Electrical and Hydraulic Engineers and Specialists,
and MANCHESTER, GLASGOW, LEEDS, BIRMINGHAM, AND ARBROATH

When writing to Advertisers please mention The Builders' Journal.



SOME "SIMPLEX" FITTINGS.

Fixing block.

Corridor bracket with cast-iron shade.

Insulating facings for wood blocks and iron boxes.

Trade and Craft.

Simplex Conduit and Fittings.

Though this is pre-eminently the day of the specialist, so that the architect is more than ever disposed to leave the working-out of the details for the lighting, heating, drainage—even the decoration—of his buildings to those trade firms who devote themselves exclusively to such work, it becomes correspondingly requisite for him to be familiar with the proper way in which the work should be carried out, in order that he may not be imposed upon by unprincipled contractors. Take electric lighting as an example. He cannot be expected to know the minutiæ of such work, but he should be sufficiently well informed to distinguish between good and bad methods of wiring, to know the relative merits of lamps, their cost and maintenance, and other matters which concern the ultimate success of the installation. It is in this connection that we draw attention to the excellent handbook issued by the Simplex Steel Conduit Co., Ltd, of Westinghouse Building, Norfolk Street, Strand, whose price list for 1905 is also to hand. The conduit system is so well known now that there is no need to expound its advantages. Of course its especial merit is the neatness and facility with which a system can be laid out, and the ease with which any part can be got at; moreover, Simplex steel conduits are so carefully made that there is absolutely no chance of short-circuiting by reason of the wires being abraided by roughness or burrs inside. The parts for attachment to the tubing are so many and various that we cannot attempt to enumerate them here; we must refer the reader to the Simplex handbook for details of each; but a good idea of their neat design can be gained from the four illustrations above, showing a tumbler point, a fixing block, a corridor bracket, and the Simplex clips for attaching lights to girders. In the price list we note there are several important percentage reductions, the light- and heavy-gauge conduits being reduced by 12·4 per cent., couplings, bends, **T**-pieces and reducers by 17·8 per cent., junction boxes by 11·5 per cent., and brackets, pendant fittings, wiring accessories, running joints, &c., by 17·5 per cent.; thus bringing the system more than ever within the scope of the most inexpensive installations.

Builders' Notes.

Battersea Town Hall Estate. — The houses which have been built on this estate by the Battersea Borough Council (by direct employment) will be opened on Saturday, March 11th, at 3 p.m.

London Building Acts Amendment Bill.—The Lord Mayor has fixed Friday, March 3rd, for the holding of a meeting at the Guildhall at which, so far as the citizens are concerned, this Bill will be finally condemned.

Messrs. Main & Co., Ltd., of Glasgow, have secured the contract for the steel buildings to form the new workshops for the Britannia Royal Naval College at Dartmouth. The firm's works are to run day and night to complete the order.

The Patent Victoria Stone Co. has declared a dividend of 10 per cent. for the past year, with an additional dividend by way of bonus of 1½ per cent., less income-tax, on the second half-year's dividend. The nett profit for the year, after making provision for depreciation of plant, &c., was £13,841.

Mr. J. Howard Colls has been presented by the London Master-Builders' Association with a portrait of himself, painted by Mr. Orchardson, in recognition of the services rendered by him to the profession in carrying the case of *Home and Colonial Stores* v. *Colls* to the House of Lords.

Nottingham Master-Builders' Association.—At the annual dinner held last week Mr. E. Hind, alluding to the cry for cheaper houses, asked "How can we build cheap dwellings when we have so much Corporation red tape tied round our necks?" If only they could get in the council-chamber a few more gentlemen representing the building interests, they would not have all that red-tapeism and officialism brought before them in all their dealings.

Llandudno and District Building Trades Employers' Association.—Speaking at the annual dinner of this Association on Thursday last, Mr. H. Lever, of Liverpool, chairman of the Lancashire, Cheshire and North Wales Builders' Federation, said the Federation had done good by endeavouring to obtain a fair form of contract and a fair arbitration clause, and they were endeavouring to put an end to the practice of asking builders to send in priced quantities with tenders.

Sir William Grantham's Plans. — The "Local Government Chronicle" for February 25th gives, for the first time, fac-simile reproductions of the cottage plans deposited by Sir William Grantham with the Chailey Rural District Council, which were the subject of the recent prosecution. A full statement of the facts bearing on the proceedings is also published, so as to enable anyone to form a judgment as to how far the Council were justified in the action they took.

Worcester and District Master-Builders' Association.—At the annual dinner held last week Mr. Sharman Wood, in proposing "Success to the Midland Federation of Master-Builders," said that the Midland Centre had done very good work in the past, and had settled many disputes. Col. Barnsley and himself had to meet the representatives of the National Union of Plasterers in order to try to settle a difficulty, and he hoped they would succeed. At their last meeting a general hope was expressed that 1904 would be a more prosperous year, but prosperity had not arrived, and he feared the outlook was not encouraging. Col. Barnsley, in reply, said there were about thirty associations connected with the Midland Centre, having a membership of about 750. The trade was more depressed now than he had ever known it. Referring to the goodwill of the building trade, he said that in 1871 there were 580,000 men engaged in that trade, and to-day the number had nearly doubled. If they took the low average of £1 per week, they had the sum of 48 millions spent in wages yearly, and the usual percentage for material amounted to 73 millions, so that over 120 millions were spent yearly. That did not sound like a decaying industry, and he sincerely hoped they had now reached the darkest day before the dawn of a bright period of prosperity.

Correspondence.

Cottages with Baths.

To the Editor of The Builders' Journal.

Sir,—Referring to the plan on p. 102 of your issue for last week, for heating a bath by the copper, which Mr. Death, of Ipswich, proposes to register, I may mention that twenty years ago I fitted the same arrangement in a cottage where I lived. In my case the house was already built with a copper in the scullery, and to save space and building the bath was fitted under the kitchen floor across the fireplace. A hole was cut under the hearth-rug, one joist being taken out and the ends trimmed. The trimmers and joists at the sides made a rebate into which the boards (battened together to form a lid) fitted. The lid was hinged and opened away from the fire, making a comfortable bath in cold weather, and when the lid was down the room was as before. The waste from the bath was led into the side of the yard sink outside, just above the water-seal, and had a cock fitted in it which had to be shut to get the lid down. Hot and cold water were sent in *viâ* the copper. A drawing and description of this arrangement were published in the "Pall Mall Gazette" soon after it was fitted.

While Mr. Death's scheme provides a separate apartment for the bath, it has the drawback of the sink and copper being in the kitchen. Considering that this apartment is generally the living-room, these details are better outside in a scullery, in the opinion of—Yours truly, J. H.

Mr. James A. King, retired builder, of Aberdeen, died recently, aged 76.

Mr W. H. Curtin, sanitary inspector for Lincoln, died recently, aged 45, from typhoid fever.

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
March 2	Glaisdale, Yorks—Pair of Villas	——	E. H. Smales, 51 Flowergate, Whitby.
,, 3	Connor Downs—Ten Houses	J. Sampson	Salt Lake House, co. Down.
,, 4	Cwmaman, S. Wales—Police-station	Joint Committee	Police-station, Aberdare.
,, 4	Nelson—Free Library	Corporation	J. H. Baldwick, Town Hall, Nelson.
,, 4	Cheddleton, Staffs—School	County Council	Offices of Education Committee, Stafford.
,, 4	Coundon, Bishop Auckland—School	——	J. Keenan, North Bondgate, Bishop Auckland.
,, 4	Drayton Bassett, Staffs—School	County Council	Offices of Education Committee, Stafford.
,, 4	Rhos, Wales—Alteration, &c., to School	——	Schoolroom, High Street, Rhos.
,, 4	Llanbedr—Rectory	——	H. Douglas, Blessley, 22 Trinity Street, Cardiff.
,, 6	Mendlesham, Suffolk—Blacksmith's Shop	Trustees	H. G. Bishop, Market Place, Stowmarket.
,, 6	Greystones—Alteration to Gallery of Church	——	J. F. Fuller, 179 Great Brunswick Street.
,, 6	Londonderry—Goods Office	G.N. Railway Co. (Ireland).	W. H. Mills, Amiens Street Terminus, Dublin.
,, 6	Lyddington, near Uppingham—Classroom	Managers of Lyddington School	School, Lyddington.
,, 6	Tonypandy, Wales—Two Shops	——	R. S. Griffiths, Excelsior Buildings, Tonypandy.
,, 6	Walton-on-Naze—Schools	Managers	F. Whitmore, Duke Street, Chelmsford.
,, 6	Newcastle-on-Tyne—Work, &c., for Alnwick Station	War Department	Royal Engineer's Office, 13 Bell Grove Terrace, Newcastle-on-Tyne.
,, 6	Ashton-under-Lyne—Vicarage	——	T. George & Sons, 7 Warrington Street, Ashton-under-Lyne.
,, 6	Walsall—Schools	Education Committee	Baily & McConnal, Bridge Street, Walsall.
,, 7	Bromley, Kent—Library	Town Council	Town Clerk's Office, Bromley, Kent.
,, 7	Settle—Residence	——	J. Harley, Architect, Skipton.
,, 7	Sunderland—Extension to Administrative Block at Sanatorium.	Corporation	Borough Surveyor's Office, Town Hall, Sunderland.
,, 8	Llanrhaiadr-yn-Mochnant, Wales—Post-office	——	Shayler & Ridge, Bank Chambers, Oswestry.
,, 8	Sheerness—Wooden Pier	——	Secretary, Co-operative Society, Ltd., 94 High Street, Sheerness.
,, 8	Hampstead—Addition to Coal Store	Metropolitan Asylums Board	Office of Board, Embankment, E.C.
,, 8	Norwich—Alterations, &c., to Free Library	——	A. E. Collins, Guildhall, Norwich.
,, 9	Newhall, Burton-on-Trent—Extension to Sunday School	Trustees of Wesleyan Chapel	C. H. Read, Granville Mill, Swadlincote.
,, 9	Greenwich—Alterations, &c., to Relief Offices	Guardians	L. Jacob, 493 New Cross Road, S.E.
,, 10	Birstall, Yorks—Hospital	Oakwell Joint Hospital Board	William Middlebrook, 70 Huddersfield Road, Birstall.
,, 10	Ullapool, N.B.—Naval Reserve Buildings	——	Coastguard Station, Ullapool.
,, 10	Oakwell—Smallpox Hospital	Joint Hospital Board	William Middlebrook, 70 Huddersfield Road, Birstall, near Leeds.
,, 10	Banff—Naval Reserve Buildings	——	Superintending Engineer, H.M. Naval Establishment, Rosyth.
,, 11	Broadstairs—Alteration, &c., to Engine-house	Urban District Council	P. Griffiths, 54 Parliament Street, S.W.
,, 11	Barnoldswick—Additions to Station Buildings	Directors of Midland Rly. Co.	Company's Architect, Cavendish House, Derby.
,, 11	Mylor, Cornwall—Farmhouse	——	Estate Office, Carclew, Perranarworthal.
,, 11	Rye, Sussex—Ward at Infirmary	Guardians	E. J. Cory, High Street, Rye.
,, 13	Sleaford, Lincs—Two of pairs Cottages	Committee of Kesteven County Asylum.	J. Clare, County Architect, Sleaford.
,, 14	Barming Heath, nr. Maidstone—Infectious Diseases Hospital	County Asylums Committee	W. J. Jennings, 4 St. Margaret's Street, Canterbury.
,, 18	Bury St. Edmunds—School	Education Committee	Offices of Committee, Crown Street, Bury St. Edmunds.
,, 22	Cobham, near Gravesend—Laundry	Rural District Council	A. E. Loach, 8 Northcote Road, Stroud.
,, 25	Cliffe-cum-Lund, near Selby—Additions, &c., to Schools	Managers	T. S. Ullathorne, Architect, Selby.
,, 28	Crigglestone, near Wakefield—Classrooms, &c.	Education Committee	County Hall, Wakefield.
,, 31	Taunton—School	Education Committee	G. H. Kite, Municipal Buildings, Taunton.
April 6	Southend-on-Sea—School	Education Committee	R. Langton, Clarence Street, Southend.
No date	Darnall—Completion of Three Houses and Shop	——	J. W. Naylor, Incorporated Accountant, York Street, Darnall.
,,	Cardiff—Shed	Windsor Steam Co.	The Company, 3 Bute Crescent, Cardiff.
,,	Castle Donington, Derby—Wesleyan Church	Trustees	A. E. Lambert, 22 Park Row, Nottingham.
,,	London—Warehouse	Worshipful Co. of Salters	Henry Dawson, 6 Finsbury Circus, E.C.
	ENGINEERING:		
March 2	Newport, Mon.—Electric Light, &c., at Police Station	——	Borough Engineer's Office, Town Hall, Newport.
,, 2	Swindon—Carting and Laying Water Mains	Corporation	H. J. Hamp, Town Hall, Swindon.
,, 3	Conwil Cayo—Steel Girder Bridge	Rural District Council	J. E. Lloyd, 29 High Street, Lampeter.
,, 3	Ferrybridge, Pontefract—Waterworks	Rural District Council	J. Waugh, Sunbridge Chambers, Bradford.
,, 6	Sutton, Surrey—Reservoir	District Water Co.	W. V. Graham, 5 Queen Anne's Gate, S.W.
,, 6	Manchester—Laying Underground Telephone Pipes	Paving, Sewering and Highways Committee.	City Surveyor's Office, Town Hall, Manchester.
,, 6	Bundoran Junction, Ireland—Footbridge	Gt. Northern Railway Co.	P. Griffiths, 54 Parliament Street, S.W.
,, 8	London, N.—Motor Generators, &c.	Stoke Newington Bor. Council	Talbot & Stevenson, 26 Victoria Street, S.W.
,,	N. Berwick—Filters	Town Council	Leslie & Reid, 72A George Street, Edinburgh.
,, 9	Goring-on-Thames—Gasholder	Thames Valley & Goring Water & Gas Co.	Offices of Company, 20 Bucklersbury.
,, 10	Selby—Boring	Urban District Council	P. Griffiths, 54 Parliament Street, S.W.
,, 11	Uxbridge—Well Pumps, &c.	Urban District Council	F. S. Courtney, 25 Victoria Street, S.W.
,, 11	Brighouse—Widening Bridge	Corporation	S. S. Haywood, Municipal Offices, Brighouse.
,, 11	Broadstairs—Engine	Urban District Council	P. Griffiths, 54 Parliament Street, S.W.
,, 13	Axbridge—Waterworks	Rural District Council	A. Powell, 3 Unity Street, College Green, Bristol.
,, 13	Bristol—Swing Bridge	Docks Committee	W. W. Square, Cumberland Basin, Bristol.
,, 13	Glasgow—Reconstruction of Station	Caledonian Railway Co.	Company's Engineer, Buchanan Street Station, Glasgow.
,, 13	Kinver, Staffs—Water Supply	Rural District Council	Council Offices, Kinver, Staffs.
,, 13	Park Royal—Switchboards, &c.	Great Western Railway Co.	Kennedy & Jenkin, 17 Victoria Street, S.W.
,, 14	Llandyfodwg and Llantrisant—Bridge	Urban District Council	Council Offices, Bryn Menin, near Bridgend.
,, 14	Swindon—Water Supply and Sewerage Works	Corporation	H. J. Hamp, Town Hall, Swindon.
,, 31	Shanghai—Electric Tramways	Municipal Council	J. Poor & Co., 63 Leadenhall Street, E.C.
April 1	Lulea, Sweden—Dredging	——	Harbour Office, Lulea, Sweden.
,, 10	St. George's Harbour, Bermuda—Deepening, &c., Channel	Government	Coode & Son & Matthews, 9 Victoria Street, S.W.
May 1	Suakin (Red Sea)—Lighthouse	Ports and Lights Administration	Deputy-Controller-General, Ports and Lights Administration, Alexandria, Egypt.
	IRON AND STEEL:		
March 2	Manchester—Tank, &c.	Gas Committee	C. Nickson, Gas Department, Town Hall, Manchester.
,, 2	Southend-on-Sea—Iron, Steel, &c.	Corporation	E. J. Elford, Borough Surveyor, Southend.
,, 3	Barking, Essex—Ironmongery	Urban District Council	Public Offices, Barking.
,, 3	London, E.C.—Steel, &c.	E. Argentine Railway Co., Ltd.	Company's Office, Winchester House, 50 Old Broad Street, E.C.
,, 4	Colchester—Iron and Steel	Roads and Drainage Committee	H. Goodyear, Town Hall, Colchester.
,, 6	Dublin—Rails, &c.	Gt. Northern Railway Co., Ltd.	T. Morrison, Amiens Street Terminus, Dublin.
,, 6	Halifax—Iron Castings, &c.	Corporation	J. Lord, Town Hall, Halifax.
,, 7	Brisbane, Australia—Rails, &c.	——	Agent-General for Queensland, 1 Victoria Street, S.W.
,, 7	Wycombe—Cast-iron Pipes	Corporation	T. J. Rushbrooke, 77 Easton Street, Wycombe.
,, 8	Enfield—Pipes	Gt. Northern Railway Co.	R. Collins, Public Offices, Enfield.
,, 8	London, W.—Constructional Steelwork	Hammersmith Borough Council	H. Main, Town Hall, Broadway, Hammersmith.
,, 10	Brumby and Frodingham—Pipes, &c.	Urban District Council	A. Atkinson, Brigg.
,, 13	Axbridge—Pipes	Rural District Council	A. Powell, 3 Unity Street, College Green, Bristol.
,, 13	London, S.W.—Ironmongery	Urban District Council	G. B. Tomes, Council Offices, High Street, Mortlake.
,, 14	Belfast—Iron and Steel	Works Committee	Superintendent of Works Offices, Town Hall Street, Belfast.
,, 15	Colchester—Ironmongery	Elec. Light & Power Committee	A. R. Sillar, 36 Stanwell Street, Colchester.
,, 16	Reading—Tools and Ironmongery, &c.	Corporation	J. Bowen, Town Hall, Reading.
,, 17	Cheltenham—Ironmongery	Corporation	J. S. Pickering, Municipal Offices, Cheltenham.
No date	Desborough, Northampton—Rails, &c.	Co-operative Society	G. J. Diver, Engineer, Desborough.
	PAINTING AND PLUMBING:		
March 3	London, S.W.—Oils and Paints	Barnes U.D.C.	G. B. Tomes, Council Offices, High Street, Mortlake.
,, 3	Bedford—Painting Exterior of Workhouse	Guardians	Master's Office, Workhouse.
,, 3	Barking, Essex—Oil, &c.	Urban District Council	Public Offices, Barking.
,, 4	Hereford—Oils, &c.	Roads Committee	City Surveyor's Office, Hereford.
,, 14	Belfast—Oils and Paints	Works Committee	Superintendent of Work's Office, Townhall Street, Belfast
,, 15	Colchester—Oils, &c.	Elec. Light & Power Committee	A. R. Sillar, 36 Stanwell Street, Colchester.
,, 16	Reading—Oils and Paints	Corporation	J. Bowen, Town Hall, Reading.
	ROADS AND CARTAGE:		
March 2	Whitland, Wales—Hire of Stone-breaker	Rural District Council	Rees Davies, Surveyor, Whitland.
,, 2	Barrowford, Lancs—Flags, &c.	Urban District Council	J. Mallinson, Council Offices, Barrowford.
,, 3	Barking, Essex—Broken Granite, &c.	Urban District Council	Public Offices, Barking.
,, 3	Rawtenstall, Lancs—Street Works	Corporation	J. Johnson, Municipal Offices, Rawtenstall.

Complete List of Contracts Open.—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		ROADS AND CARTAGE—*cont.*		
March	4	Friern Barnet—Kerbing, &c.	Urban District Council	W. Reynolds, Surveyor, Friern Barnet.
,,	4	Beverley—Stone	Highways & Bridges Committee	County Surveyor, Beverley.
,,	4	Billesden, Leics.—Road Materials	Rural District Council	W. E. Richardson, 18 New Street, Leicester.
,,	4	Colchester—Road Materials	Roads and Drainage Committee	H. Goodyear, Town Hall, Colchester.
,,	4	Erpingham, Norfolk—Road Materials	Rural District Council	R. Mann, District Surveyor, Holt.
,,	4	New Malden—Roads	Urban District Council	T. B. Simmons, Cambridge Road, New Malden.
,,	4	Ponteland, Northumberland—Materials, &c.	Rural District Council	D. Hope, Ponteland.
,,	4	Rotherham—Road materials, &c.	Rural District Council	R. Bradbury, 29B High Street, Rotherham.
,,	4	South Shields—Road Materials	Corporation...	S. E. Burgess, Chapter Row, South Shields.
,,	6	London, S.E.—Kerbing, &c.	Lewisham Borough Council ...	Surveyor's Department, Town Hall, Catford.
,,	6	Halifax—Portland Cement, &c.	Corporation...	J. Lord, Town Hall, Halifax.
,,	6	London, S.E.—Granite Macadam, &c.	Penge U.D.C.	H. W. Longdin, Town Hall, Anerley, S.E.
,,	6	Bolton-upon-Dearne, Yorks—Broken Granite, &c.	Urban District Council	J. L. Hawksworth, Council Offices, Bolton-upon-Dearne.
,,	6	Sutton-in-Ashfield—Slag and Granite	Urban District Council	W. Burn, Surveyor's Offices, Sutton-in-Ashfield.
,,	6	Walkden, Lancs—Street Works...	Urban District Council	J. A. Corson, District Offices, Walkden.
,,	6	Wrexham—Paving, &c.	Town Council	J. England, Willow Road, Wrexham.
,,	6	Highworth, Swindon—Road Repair	Rural District Council	O. Kimber, 64 Exmouth Street, Swindon.
,,	7	Manchester—Road Materials	Withington Committee of Corporation.	Surveyor to Committee, Town Hall, West Didsbury, Manchester.
,,	7	Brighouse—Granite Macadam	Corporation...	S. S. Haywood, Municipal Offices, Brighouse.
,,	7	Haslemere, Surrey—Road Improvement Works	Rural District Council	F. Smallpiece, Clerk, Guildford.
,,	7	Hayward's Heath—Road Materials	Rural District Council	A. Macarthur, Council Offices, Hayward's Heath, Sussex.
,,	7	Leyton—Road Materials, &c.	Rural District Council	W. Dawson, Town Hall, Leyton.
,,	7	Stockton-on-Tees—Street Paving	Rural District Council	J. Rodham, Finkle Street, Stockton-on-Tees.
,,	8	Basingstoke—Granite-concrete Tubes	Corporation...	F. R. Phipps, Town Hall, Basingstoke.
,,	8	Glasgow—Whinstone	———	H. Hutcheson, 115 Wellington Street, Glasgow.
,,	11	Belford, Northumberland—Road Works	Rural District Council	C. A. Lake, Belford.
,,	11	Tadcaster—Road Materials, &c....	Rural District Council	T. Scott, Aberford, near Leeds.
,,	13	London, S.W.—Broken Guernsey Granite	Barnes U.D.C.	G. B. Tomes, Council Offices, High Street, Mortlake.
,,	14	London, E.C.—Paving, &c.	Shoreditch Borough Council ...	H. M. Robinson, Town Hall, Old Street, S.E.
,,	16	Belfast—Artificial Flags	Works Committee...	Superintendent of Works' Office, Town Hall Street, Belfast.
,,	16	Ormskirk, Lancs—Road Materials	Rural District Council	C. Law-Green, Surveyor to Council, Wigan Road, Ormskirk.
,,	16	Reading—Granite, &c.	Corporation...	J. Bowen, Town Hall, Reading.
,,	17	Cheltenham—Broken Stone, &c.	Corporation...	J. S. Pickering, Municipal Offices, Cheltenham.
,,	22	Strood, Kent—Road Materials, &c.	Rural District Council	J. E. Povey, Clerk, Workhouse, Strood.
		SANITARY:		
arch	2	Southend-on-Sea—Disinfectants...	Corporation...	E. J. Elford, Borough Surveyor, Southend-on-Sea.
,,	2	Ossett, Yorks—Sewer	Corporation...	W. Hirst, 1 New Street, Ossett.
,,	2	Wallington, near Croydon—Removal of Refuse	Croydon R.D.C.	Council Offices, Town Hall, Croydon.
,,	3	Barking, Essex—Disinfectants	Urban District Council	Public Offices, Barking.
,,	4	Darlington—Sewage Tank	Rural District Council	J. Robinson, Union Offices, Crown Street, Darlington.
,,	4	Durham—Sewer Works	Corporation...	H. W. Taylor, St. Nicholas's Chambers, Newcastle-on-Tyne.
,,	4	Rotherham—Removal of Nightsoil, &c.	Rural District Council	B. Key, 29B High Street, Rotherham.
,,	4	Hereford—Disinfectants	Sanitary Committee	City Surveyor's Office, Hereford.
,,	4	Bilston, Staffs—Sewage-disposal Works	Urban District Council	J. D. Wassell, Town Hall, Bilston.
,,	6	Abram, near Wigan—Sewerage Works	Corporation...	J. Watock, Council Offices, Abram.
,,	6	Coulsdon, near Croydon—Removal of Refuse, &c.... ...	Parochial Committee	R.D.C. Offices, Town Hall, Croydon.
,,	6	Royston, near Barnsley—Scavenging	Urban District Council	F. Smith, Council Offices, Royston.
,,	6	London, S.E.—Disinfectants	Penge U.D.C.	H. W. Longdin, Town Hall, Anerley, S.E.
,,	7	Beddington, Croydon—Removal of Refuse	Croydon R.D.C.	R.D.C. Offices, Town Hall, Croydon.
,,	7	Snaith and Gowick, near Goole—Scavenging	Goole R.D.C.	G. England, Bank Chambers, Goole.
,,	7	Boston, Lincs—Sewers	Urban District Council	J. Rowell, Church Lane, Boston.
,,	8	Newport, Mon.—Sewerage Works	Western Valleys Sewerage Bd.	T. S. Edwards, 24 Stow Hill, Newport, Mon.
,,	8	Basingstoke—Sewerage Works	Corporation...	F. R. Phipps, Town Hall, Basingstoke.
,,	8	Sanderstead, near Croydon—Removal of Refuse	Croydon R.D.C.	R.D.C. Offices, Town Hall, Croydon.
,,	10	Hamilton, N.B.—Drainage Works	District Committee	W. S. Douglass, District Offices, Hamilton, N.B.
,,	10	Ditchling, Sussex—Sewage-disposal Works	Chailey R.D.C.	Beesley, Son & Nichols, 11 Victoria Street, London, S.W.
,,	13	London, S.W.—Removal of Refuse	Barnes U.D.C.	G. B. Tomes, Council Offices, High Street, Mortlake.
,,	14	Belfast—Scavenging Brushes, &c.	Works Committee...	Superintendent of Works' Office, Town Hall Street, Belfast.
,,	17	Cheltenham—Disinfectants	Corporation...	J. S. Pickering, Municipal Offices, Cheltenham.
		TIMBER:		
arch	16	Reading—Wood Blocks	Corporation...	J. Bowen, Town Hall, Reading.

List of Competitions Open.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
arch	4	Nelson, Lancs—Library...	£50, £25 & £15	———	J. H. Baldwick, Town Hall, Nelson.
,,	30	London, S.W.—Municipal Buildings...	———	£1.	H. J. Smith, Town Hall, Kennington, S.W.
,,	31	Cnippenham—School	£30 & £20	———	W. Pullinger, Education Department, County Offices, Trowbridge.
une	1	Letchworth (Garden City)—Cottages	———	———	W. O. Cooper, 347 Birkbeck Bank Chambers, High Holborn.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

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ADVERTISER (21), 4 years' Articled with Country Architect and 1 year previous with a Builder's firm, wishes to enter a first-class Builder's office (Midlands or E. Anglia preferred), drawing, tracing, and knowledge of quantities, &c.—P. S. MINNS, 7, York Place, Wisbech. 981

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ARCHITECT'S ASSISTANT (24) requires engagement; 9 years' experience. Design, working drawings, details, specifications, &c.—W. H. L., 116, Sugden Road, Clapham Common, S.W. 932

ARCHITECT'S ASSISTANT (27) desires engagement, 11 years' experience; working drawings, details, designs, specifications, quantities, levelling. —J. W., 8, Rylett Crescent, W. 970

ARCHITECT'S ASSISTANT (24) desires situation; contract drawings; details, &c.; surveying, assistance with quantities; good experience. —Box 977, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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BRICKWORK and POINTING WANTED. Town or country. rod or lump, good references.—H. H., 31, Stanley Road, East Sheen, S W. 933

BRICKWORK, GAUGEWORK, TILING and POINTING WANTED. Labour only. Large job preferred. First-class references from leading London builders.—A, 110, Vassall Road, Stockwell, S.W. 968

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BUILDER'S JUNIOR CLERK requires ENGAGEMENT; 3½ years in Builder's office; good references; salary moderate; abstainer.—AYLES WATERS, Home Farm, Grateley, Hants. 978

BUILDER'S MANAGER or Clerk of Works; re-engagement wanted by practical energetic man. Abstainer; good references; or would manage branch business. Town or country.—THOMAS, 73, Norfolk Road, Margate. 929

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QUANTITIES. Assistance rendered in taking off, working up, variations, &c. Good references. Terms moderate.—X., 2, Seymour Terrace, Anerley, S.E. 910

QUARRY MANAGER or FOREMAN MASON seeks situation; 20 years' experience in mining and open quarrying and management of men. Detail draughtsman.—Address F. H., 100, Tennyson Road, Kilburn, London, N.W. 958

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897.—QUANTITY SURVEYOR.
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ARCHITECT'S PUPIL.—A VACANCY offers in busy West End office; small premium required, but must be fond of drawing.—BARRETT & DRIVER, Architects, 23, York Place, Baker Street.

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SEE PAGES XVII and XXII FOR EMPLOYMENT REGISTER.

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MAGISTRATES' COURTS, ENFIELD.

The Finance Committee invite TENDERS for the ERECTION of CARETAKER'S QUARTERS on a site adjoining the above.

MAGISTRATES' COURTS, WILLESDEN.

The Finance Committee also invite TENDERS for the ERECTION of CARETAKER'S QUARTERS on a site adjoining these Courts.

Plans and specifications may be seen, and information obtained (in respect to each building), at my Offices on payment of two guineas, which will be returned on receipt of a boná-fide Tender.

Tenders, sealed and endorsed "Caretaker's Quarters," to be delivered at the Offices of Sir RICHARD NICHOLSON, Middlesex Guildhall, Westminster, S.W., on or before Monday, MARCH 13th, 1905.

The County Council will not necessarily accept the lowest or any Tender.

H. T. WAKELAM,
County Architect.

Middlesex Guildhall,
Westminster, S.W.
February 21st, 1905.

WEST SUFFOLK EDUCATION COMMITTEE.

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To Builders.

The Committee are prepared to receive TENDERS for the ERECTION of a SECONDARY SCHOOL and PUPIL TEACHERS' CENTRE at Bury St. Edmunds for 210 scholars.

The drawings, specifications, and form of Contract may be inspected at the Office of the EDUCATION COMMITTEE, 5, Crown Street, Bury St. Edmunds, and at the Office of the COUNTY ARCHITECT, Sudbury, Suffolk.

Builders desirous of tendering must send in their names and addresses at once to the undersigned. A copy of the quantities and form of Tender will be sent to those builders selected to tender on depositing £5, which will be returned on receipt of a boná-fide Tender.

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A. AINSWORTH HUNT,
County Architect.
Sudbury and Bury St. Edmunds.

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Too late for Classification.

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968.—BRICKWORK, GAUGEWORK, TILING & POINTING. Labour only; large job preferred, ex. London refs.

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970.—ARCHITECT'S ASSISTANT (27); 11 yrs. exp. wkg. drawings, details designs, specifications, quantities and levelling.

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977.—ARCHITECT'S ASSISTANT (24). Contract drawings, details, &c. Surveying assistance with quantities.

978.—BUILDER'S JUNIOR CLERK; 3½ yrs. in builder's office; good refs.; abstainer; mod. s.

979.—PAPERHANGER, plain and decorative grainer and decorator; day, piece or working foreman; town or country; ex. refs.

980.—ARCHITECT'S JUNIOR ASSISTANT (22); 4½ yrs. London exp., office routine, &c.; sal. 25s.

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See p. xxii *for the Employment Register.*

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3. Correspondents are particularly requested to be as brief as possible.

4. The querist's name and address must always be given, not necessarily for publication.

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We mean by a Regular Reader anyone who has placed an order with us or any newsagent or bookstall for the BUILDERS' JOURNAL for one year.

Those readers who order the BUILDERS' JOURNAL through their local newsagent or bookstall should send us the newsagent's receipt. Their names will then be placed on our subscribers' list, and they will be entitled to all the advantages set out above.

5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS
OFFICE: 6, GREAT NEW STREET, FETTER LANE, E.C.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Bradford. — Accepted for extensions to vegetable market, St. James's Market, for the Corporation :—

Mason—M. Booth & Sons.
Joiner—Greenwood Brothers.
Ironfounder—S. Parsons & Co., Ltd.
Plumber—S. E. Jackson.
Slater—Hillam Brothers.
Painter—E. Briggs & Son.
[All of Bradford.]

Bradford.—Accepted for the erection of two hospitals at the union workhouse, Horton Lane, for the Guardians. Mr. Fred Holland, engineer and architect, 11, Parkinson's Chambers, Hustlergate, Bradford :—

Mason—O. Booth & Sons, Great Horton	£7,074	0	0
Joiner—W. M. Binns	1,738	11	0
Plasterer and tiler—C. Howroyd & Sons	1,576	15	0
Plumber—R. Townend	1,098	0	0
Electrician—Smith & Croft	272	11	0
Slater—Hill & Nelson	248	0	0
Painter—J. Marsland	131	10	11

[Rest of Bradford.]

Brandon Colliery (near Durham).—Accepted for the erection of a new Wesleyan Methodist chapel. Mr. H. T. Gradon, architect, Durham :—

W. Hall, Bensham, Gateshead	£1,254	10	0

[Revised and accepted tender.]

Clapham Common, S.W.—For alterations at the rear of the "Cock" tavern, for Messrs. Watney, Combe, Reid & Co., Ltd. Messrs. Barrett & Driver, architects, 23, York Place, Baker Street, S.W. :—

H. Somerford & Son, Clapham	£96	10	0
E. Triggs, Clapham	93	0	0
Edwards & Medway,* Ethelred Street, Kennington	89	0	0

* Accepted.

Cononley (Keighley).—Accepted for the erection of ten houses. Messrs. John Haggas & Sons, architects, North Street, Keighley :—

Mason—E. Turner, Utley.
Joiner—J. Laycock, Cononley.
Slater—T. Throup.
Plasterer—A. Shuttleworth, Skipton.
Plumber—Midgley & Dinsdale, Keighley.
[Total, £1,884 15s.]

Dagenham (Essex).—For sewerage and sewage-disposal works, for Romford R.D.C. Mr. John Simmons, M.I.C.E., engineer, Doncaster :—

A. G. Osenton, Walmer	£30,094	0	0
J. Moran & Son, London	25,855	18	0
T. Free & Son, Maidenhead	25,346	0	0
W. H. Wheeler, Southwark	25,198	7	0
T. Adams, London	23,993	8	9
J. Jackson, Plaistow	23,346	0	0
E. Iles, junr., Wimbledon	23,258	4	8
E. Blomfield, Tottenham	22,700	0	0
S. W. Harrison & Co., Birmingham	22,696	0	0
G. Bell, Tottenham	22,666	0	0
F. J. Coxhead, Leytonstone	22,220	0	0
G. Wimpey & Co., Hammersmith	22,043	0	0
W. Iles, Southend	22,000	0	0
G. Rutter, Barry, Cardiff	21,945	3	2
F. W. Trimm, Dorking	21,937	0	0
Johnson & Langley, Leicester	21,500	0	0
Edwards & Co., London	21,042	18	0
Bentley & Loch, Leicester	21,026	6	0
W. E. Westgate, Romford	20,672	0	0
Wilson, Border & Co., Romford	20,200	0	0
Hewett & Sons, Ltd., Barking	19,630	2	3
H. Arnold & Son, Leeds	19,190	0	0
E. Tabor, Cambridge	18,104	5	9
D. T. Jackson,* 106, Ripple Road, Barking	17,626	5	5

* Accepted. [Engineer's estimate, £20,597.]

Dalkeith. — Accepted for new premises for the Dalkeith Public-house and Improvement Co., Ltd. Mr. Charles H. Greig, architect, 6, York Place, Edinburgh :—

Mason — S. & R. Slater, Edinburgh	£829	10	0
Joiner — Steven & Stoddart, Bonnyrigg	700	0	0
Plasterer—George Grieve & Sons, Dalkeith	180	7	6
Plumber — William Thorburn, Dalkeith	174	0	0
Slater, tiler and harler — James V. Hogan, Dalkeith	125	7	8

[Total, £2,009 5s. 2d.]

Dover.—For extensions to the premises of the River and District Co-operative Society, Biggin Street. Mr. A. H. Steele, architect, 1, Effingham Lawn, Dover. Quantities by the architect :—

Keeler	£2,351
Stokes	2,344
Paramor	2,328
Munro	2,279
Adcock	2,252
Beaufoy	2,217
W. G. Lewis	2,213
Grigg	2,207
Morgan	2,199
R. & G. Brisley	2,192
Austen & Lewis	2,184
Lewis & Sons*	2,121

* Accepted. [Architect's estimate, £2,142.]

Farnham (Surrey).—For the erection of a new grammar school, for the Governors. Messrs. Jarvis & Richards, architects, 36, Victoria Street, Westminster, S.W. :—

Udall & Co.	£8,387
Ennes Brothers	8,107
S. F. Halliday	8,037
W. Wallis	7,996
Potter Brothers	7,995
A. G. Mardon	7,992
Chessum & Son	7,930
Parnell & Sons	7,878
Ferguson & Co.	7,858
F. G. Minter	7,773
Holliday & Greenwood	7,708
T. J. Hawkins & Co.	7,675
Martin, Wells & Co.	7,666
Jenkins & Son	7,595
Kirk & Randall	7,575
W. & D. Wilkins	7,570
Mussellwhite & Sapp	7,560
R. Dean & Co.	7,538
Willcock & Co. and Drowley & Co.	7,496
Thomas & Edge	7,491
Y. J. Lovell	7,490
Goodall & Sons	7,467
McC. E. Fitt	7,393
W. H. Lorden & Son	7,373
W. J. Renshaw	7,366
A. Hudson & Co.	7,350
Tompsett & Co.	7,313
G. Kemp	7,309
J. Smith & Sons	7,299
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E. C. Hughes	6,965
H. Kent	6,907
J. J. Wise	6,853
Annett & Sons	6,850
A. Churter	6,603
Crosby & Co.	6,580

Keresley, Coventry.—For the erection of a motor-house, for Mr. W. Hillman. Messrs. Barrett & Driver, architects, 23, York Place, Baker Street, W. :—

A. Beacham, junr., Allesley, near Coventry	£126	10	0
C. Garlick, Coventry	120	0	0
Kelley & Son,* Little Heath, Foleshill, Coventry	103	16	0

* Accepted.

Liphook (Hants).—For the erection of a block of four cottages at Wheatsheaf Common, for Mr. J. C. Hawkshaw. Mr. W. A. T. Carter, architect, 15, Waldemar Road, Wimbledon, S.W. :—

P. Adams, Liphook	£1,861	5	0
F. Chinchen & Co., Bagshot	1,800	0	0
J. Holder & Son, Petersfield	1,775	15	7
J. Lee, Godalming	1,760	0	0
Sycamore Works, Ltd., Wimbledon	1,688	11	1
W. Mould, Petersfield	1,688	7	0
W. N. Brading, West Liss	1,683	19	0
Crosby & Co., Farnham	1,593	0	0
G. Chesswas, Isleworth	1,587	13	4
W. Randall & Sons, Horsham	1,500	0	0
A. Cæsar & Sons, Liphook	1,455	0	0

Nuneaton.—For two silt-filters and works of underdrainage at Hartshill sewage-disposal works. Mr. F. C. Cook, engineer :—

Johnson Brothers, Hereford	£2,123	6	5
H. Ashby, Mansfield	1,998	2	4
W. Cunliffe, Birmingham	1,916	7	0
T. Smith, Nuneaton	1,909	4	4
A. Jewell, Market Harborough	1,734	0	0
J. Owens, Wolverhampton	1,588	5	4
Langley, Hardy & Johnson, Leicester	1,561	18	8
G. Holloway,* Wolverhampton	1,300	0	0

* Accepted.

Rushden (Northants).—For the erection of a free library, for the Library Committee. Mr. W. B. Madin, architect, Vestry Hall, Rushden. Quantities by architect :—

	Ketton stone.			Stamford stone.			Corsham Down Bath stone.		
Cracknell, Peterborough	£2,718	0	0	£2,698	0	0	£2,658	0	0
Co-operative Builders, Kettering	2,610	0	0	2,510	0	0	2,500	0	0
G. Henson, Wellingborough	2,492	0	0	2,375	0	0	2,363	0	0
Hacksley Brothers, Wellingborough	2,469	0	0	2,362	0	0	2,350	0	0
R. Marriott	2,440	0	0	2,417	0	0	2,365	0	0
T. Willmott	2,425	0	0	2,387	0	0	2,369	0	9
Harrison & Winn	2,394	0	0	2,356	0	0	2,340	0	0
H. Sparrow	2,372	2	8	2,333	11	8	2,318	2	8
Whittington & Tomlin	2,357	0	0	2,272	0	0	2,272	0	0
Brown & Sons, Wellingborough	2,354	12	6	2,245	12	6	2,238	0	0
C. E. Bayes	2,345	0	0	2,270	0	0	2,260	0	0
Berrill & Green, Wellingborough	2,300	0	0	2,260	0	0	2,245	0	0
Higgs, Northampton	2,299	10	0	2,260	19	0	2,245	10	0
W. Packwood*	2,288	19	0	2,238	9	0	2,222	12	0

* Accepted. [Architect's estimate £2,360.] [Rest of Rushden.]

(*Continued on* p. xx.)

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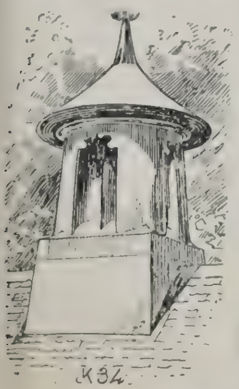

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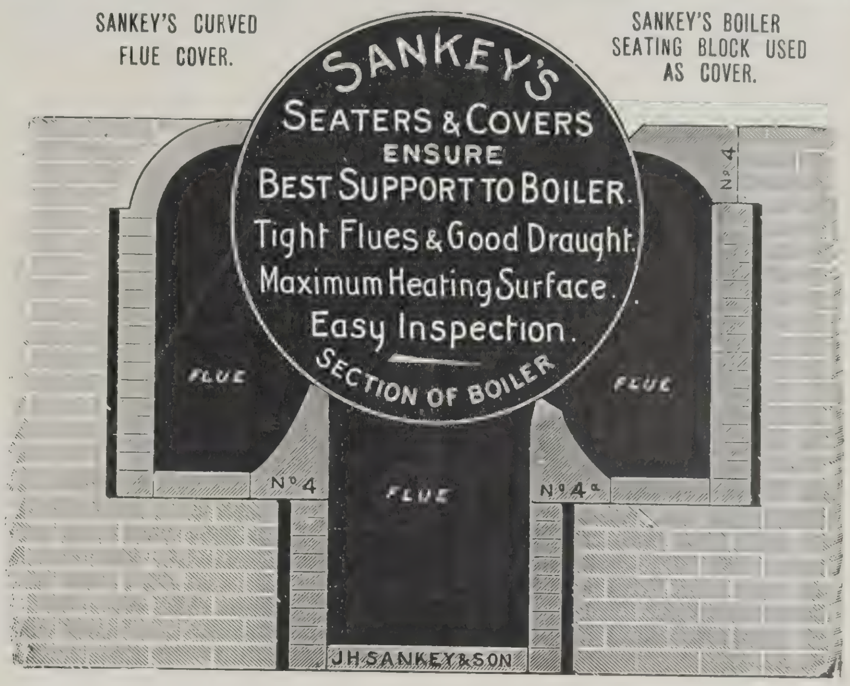

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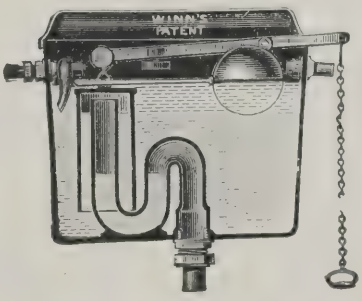

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TENDERS *cont. from p.* xviii.

Sheffield.—For the erection of extensions and alterations to the Blind Institution in West Street. Mr. Edmund Winder, architect, Corn Exchange Chambers, Sheffield :—

Gray & Son, Tinsley	£5,865	0	0
J. Fidler, Ltd.	5,820	0	0
Martin & Hughes	5,777	0	0
A. Moore	5,700	0	0
H. Winter, Handsworth	5,575	0	0
Pinder Brothers & Bone, Intake	5,445	0	0
Powell & Son	5,300	0	0
E. Bates, Intake	5,300	0	0
Wilson & Kennington	5,177	0	0
Longden & Son, Ltd., Neepsend	5,123	0	0
C. H. Gillam	5,001	10	0
Dawson & Jones & Co.	4,999	15	0
J. Eshelby & Son	4,998	0	0
E. & W. Oxley	4,998	0	0
Wilkinson & Son, Heeley	4,995	0	0
J. & H. Wneen	4,965	0	0
J. Mason	4,913	10	0
Badger & Appleby	4,910	0	0
H. Watkinson	4,902	0	0
A. Bradbury	4,880	0	0
H. White	4,842	0	0
O'Neill & Son,* Bower Road	4,160	0	0

* Accepted. [Rest of Sheffield.]

Twickenham.—For the erection of pumping station, boiler-house, destructor-house, chimney shaft, workshops, cottages, &c., at sewage-disposal works for the U.D.C. Mr. Fred W. Pearce, F.S.I., surveyor, Town Hall, Twickenham. Mr. William Fairley, engineer, 69, Victoria Street, Westminster, S.W. —

				A.		
Ferguson & Co.	£15,350	0	0	£650	0	0
T. L. Fearon	14,387	0	0	164	0	0
Mowlem & Co., Ltd.	14,290	0	0	31	0	0
J. W. Brooking	13,900	0	0	400	0	0
Johnson & Son	13,374	18	5	156	17	11
Speechley & Smith	12,950	0	0	370	0	0
Pethick Brothers	12,813	0	0	400	0	0
Hudson & Co.	12,758	0	0	302	5	0
L. F. Lamplough	12,500	0	0	287	0	0
Chambers Brothers	12,494	0	0	566	0	0
Chessum & Sons	12,440	0	0	340	0	0
Soole & Son	12,440	0	0	415	0	0
Perry & Co	12,320	0	0	350	0	0
E. Potterton	12,240	0	0	183	0	0
Thomas & Edge	12,149	0	0	330	0	0
Kingerlee & Sons	11,995	0	0	480	0	0
Lawrence & Son	11,988	0	0	294	0	0
Wilkinson Brothers	11,986	0	0	240	0	0
Kirk & Randall	11,977	0	0	300	0	0
Willcock & Co.	11,965	0	0	350	0	0
W. Watson	11,959	0	0	275	0	0
Foster Brothers	11,898	0	0	284	0	0
W. Wallis	11,700	0	0	515	0	0
F. G. Minter	11,585	0	0	265	0	0
W. J. Renshaw	11,397	0	0	349	0	0
F. & E. Davey, Ltd.	11,387	0	0	700	0	0
Kerridge & Shaw	11,347	0	0	245	0	0
B. E. Nightingale	11,300	0	0	250	0	0
Cowley & Drake	11,265	9	7	735	7	10
Johnson & Co.	11,200	0	0	250	0	0
G. Wimpey & Co.	11,139	0	0	350	0	0
E. Wall	10,962	0	0	188	0	0
S. Page & Son	10,649	0	0	387	0	0
G. H. Gibson	10,590	0	0	298	0	0
Wisdom Brothers	10,475	0	0	250	0	0
Haycock & Sons	9,930	0	0	227	0	0

A.—Deduction if patent Victoria stone is used.

Woolwich.—For reinstatement after fire, and alterations and additions to Royal Artillery Theatre (main structure). Mr. W. G. R. Sprague, architect, Criterion Chambers. 10 and 11, Jermyn Street, S.W. Quantities by Mr. A. R. Henderson, surveyor, 47, Pall Mall, S.W. :—

Patman & Fotheringham	£8,500
G. Longden & Son	8,300
H. Lovatt	8,000
W. Wallis	7,990
Perry & Co.	£7,978
Harris & Wardrop	7,844
C. F. Kearley	7,594
G. Munday & Son	7,381
C. G. Hill	7,350
W. H. Lorden & Son	7,169

Coming Events.

Wednesday, March 1.

ROYAL SANITARY INSTITUTE. — Inspection and Demonstration at St. Pancras, conducted by Mr. W. G. Auger, sanitary inspector, at 3 p.m.

SURVEYORS' INSTITUTION.—Annual dinner, Hotel Great Central, at 7 p.m.

INSTITUTION OF CIVIL ENGINEERS. — Students' Visit to works in progress at Victoria Station, at 2.30 p.m.

ARCHITECTURAL ASSOCIATION (Discussion Section). —Mr. E. J. Stubbs on "Flats," at 7.30 p.m.

SOCIETY OF ARTS.—Mr. Isidore Spielmann, F.S.A., on "The British Art Section of the St. Louis Exhibition," at 8 p.m.

Thursday, March 2.

ROYAL SANITARY INSTITUTE.—Demonstration of Bookkeeping as carried out in a Sanitary Inspector's Office, at Islington Town Hall, by Mr. James R. Leggatt, at 7 p.m.

ROYAL ACADEMY.—Professor Aitchison on "Vitruvius," at 4 p.m.

CARPENTERS' COMPANY.—Mr. C. Welch on "The Livery Companies and their Halls, Ancient and Modern," Carpenters' Hall, at 8 p.m.

CHEMICAL SOCIETY.—Meeting at 8 p.m.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—Mr. J. F. Reade on "Engineering Expert Evidence," at 8 p.m.

Friday, March 3.

ROYAL ACADEMY.—Professor Waldstein on "Greek Sculpture," at 4 p.m.

JUNIOR INSTITUTION OF ENGINEERS.—Mr. Walter Longland, A.M.I.M.E., on "Possible Improvements in Locomotive Practice," at 8 p.m.

Saturday, March 4.

ROYAL INSTITUTION.—Mr. D. G. Hogarth on "Archæology," at 3 p.m.

Monday, March 6.

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. George P. Bankart on "Leadwork."

ROYAL ACADEMY.—Professor Waldstein on "Greek Sculpture," at 4 p.m.

Tuesday, March 7.

SOCIETY OF DESIGNERS.—Mr. E. F. Strange on "Ornament from Old English Rood-Screens," R.B.A. Galleries, at 8 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Annual meeting at 7.30 p.m.

Wednesday, March 8.

ROYAL SANITARY INSTITUTE — Inspection and Demonstration at Islington, by Mr. James R. Leggatt, at 2 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—M. Hippolyte J. Blanc, R.S.A., on "The Arts of the Monastery," at 8 p.m.

Thursday, March 9.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY. —Mr. E. C. Skill on "Architectural Photography," at 6.30 p.m.

CARPENTERS' COMPANY.—Dr. J. Willis Clark on "The Origin and Development of the Collegiate Plan at Oxford and Cambridge," at 8 p.m.

Friday, March 10.

ARCHITECTURAL ASSOCIATION.—Mr. H. V. Lanchester, A.R.I.B.A., on "Law Courts," at 7.30 p.m.

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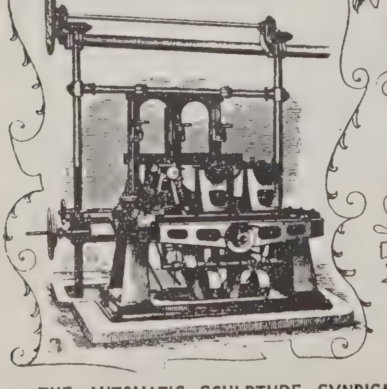

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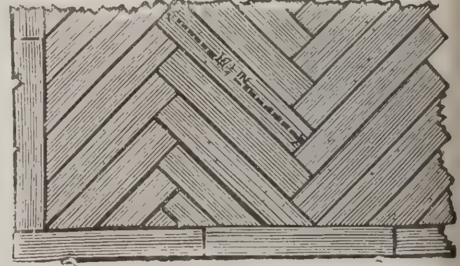

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THE

BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

March 8, 1905. Vol. 21, No. 526.

6, Great New Street, Fetter Lane, E.C.

Summary.

Whilst giving evidence in a Government case at Exeter last week, Sir John Jackson said he had used $2\frac{1}{2}$ million cubic feet of granite in the Keyham extension works, 60 per cent. of which was Cornish, 36 per cent. Norwegian and 4 per cent. from Dartmoor. The Norwegian quarrymen worked more regularly and at half the pay of English workmen. People who put money into English granite quarries were simply throwing it into the sea. (Page 126.)

The new cathedral of Berlin has cost £500,000. Its cupola and cross reach a height of 374ft., which is about 79ft. less than St. Peter's, Rome, and about 9ft. more than St. Paul's Cathedral. (Page 127.)

The Institute memorial as to municipal architecture being placed in the hands of borough engineers and surveyors appears to be very ill-received—in some instances with laughter. (This page.)

The Bristol Society of Architects has passed a resolution in favour of architects' registration. The Sheffield Society of Architects and Surveyors has also reaffirmed its approval of the scheme. (Page 127.)

A dispute has arisen between the master-builders of Dublin and the Brick and Stonelayers' Society as to work being done by piece or measurement for persons who are not regular builders. The employers have decided on a lock-out. This affects 2,000 men. (Page 126.)

A concrete floor constructed at King Cross Wesleyan School, Halifax, by Messrs. Stuart's Granolithic Stone Co., Ltd., was recently tested with satisfactory results. The slab was 9ft. 4ins. by 3ft. 6ins. by 4ins. thick, supported at each end by a girder and on one side by a wall, and was weighted with $2\frac{1}{2}$ cwts. per square foot. The deflection at the centre was not more than $\frac{1}{16}$in., and when the load was removed the slab resumed its normal position. (Page 126.)

An interesting case in which a temperance club committee tried to shuffle out of an arrangement with an architect who prepared a design for them is given on p. 123.

In a paper on paint specifications which he read before the Aberdeen Society of Architects last week Mr. J. Cruickshank Smith, B.Sc., said although it might be natural that architects and engineers who specified or used paints should possess neither the exact scientific knowledge of the manufacturer nor the practical experience of the painter, there appeared to be a supine or neglectful attitude on the part of many towards paint questions, which, perhaps, accounted somewhat for the lack of proper wording in the framing of paint specifications — the phraseology of which appeared to have remained practically unaltered for two generations at least. (Page 122.)

Snubbing the Institute. The memorial against the growing practice of municipal and county authorities entrusting the design of important architectural work to their paid officials, which was sent out three months ago in the name of the Royal Institute of British Architects and its allied societies, appears to have met with very little grace or consideration from noble councillors in different parts of the country. As Mr. Arthur Clyne observed in a speech at the annual dinner of the Aberdeen Society of Architects last week, if local newspaper reports can be relied on, in several instances the memorial has been received with laughter. The latest instance is that of the Levenshulme (Manchester) Council, which laid the memorial on the table when it came before them last week, councillors agreeing that they could certainly do without such "officiousness." We join with Mr. Clyne that is is deeply to be regretted that in quarters where the architect is entitled to look for sympathy and support so little importance should be attached to considerations such as those urged by the Royal Institute and its allied societies.

A Garden Suburb. There has long been a concensus of opinion that, speaking paradoxically, the best way to live in London is to live out of it: but the difficulties of securing comfortable houses at reasonable rentals, in agreeable districts, and at not too great a distance from town, are very considerable. Everyone has his own opinion as to which is the best part of London to live in, but it is generally agreed that Hampstead has many attractions. Thus it comes about that a scheme is now being mooted for the formation of a garden suburb there. An influential committee has been given (by the Eton College Trustees) the option of purchasing 240 acres of land surrounding the new extension of the Heath and sloping towards the north-west: and on this land it is proposed to build houses of all sorts, from large mansions to cottages let at 7s. 6d. a week, and to lay out the suburb on orderly lines. The committee also has in view the preservation of the Heath from the speculative builder. Judging by the announcement made through the Press, there would seem to be a touch of the garden-city mania among the committee, and not a little socialism—as evidenced by their desire that "every resident may share in the church, the chapel, the public library, and the open space, not by forced artificial methods, but as inhabitants of the garden suburb"—nevertheless the idea itself is a commendable one, and we trust it may be carried out, though we fear that it is all a matter of comparative cost; and past experience does not convince us of the business qualities of that section of fanatics who pass under the names of "art architects" and "social reformers."

The Forthcoming Academy. Only about a fortnight remains before the Royal Academy sending-in day—Friday, March 24th—and we therefore take occasion to remind architects once more how desirable it is that they should let us have their drawings as early as possible. A certain few, indeed, have reached us already, but we know from bitter experience that the majority leave it till the last moment, and then we receive so many drawings that it is a very onerous task to get them reproduced and afterwards delivered at Burlington House in good time. We have even known architects to be so dilatory that their drawings have reached us the morning after sending-in day, and they have then learnt that the Academy officials will not consider any excuse whatever, absolutely refusing in every case to take in drawings after the appointed hours. May we therefore again ask for these pictures to be forwarded as early as possible.

An American Gold Medal. While referring to the Academy it is opportune to note that the New York Chapter of the American Institute of Architects has established a Medal of Honour to be awarded through the annual exhibition of the Architectural League of New York. Any architectural work in the United States, or territory belonging to it, if completed within five years previous to the date of exhibit, may be offered for consideration: but—and this is the particular point to note, bearing in mind the present unsatisfactory limitations of the Architectural Room at Burlington House—the architect or architects, in order to be eligible for the award, must present for exhibition one or more photographs of the executed work, as well as one or more drawings, including a small scale plan, and, in addition, they are to submit such working drawings of the structure as the jury may desire to examine. One almost despairs at making any radical alteration in the rules of such an institution as the Academy, but we yet hope to see photographs of architecture hung in its "whispering room"; for there can be no doubt that these afford the best of all representations of completed works

PAINT SPECIFICATIONS.

SOME notes on the specifying of painters' materials were given by Mr. J. Cruickshank Smith, B.Sc., of London, before the Aberdeen Society of Architects last week. He said there were two standpoints from which the question might be approached, namely, the manufacturing or scientific standpoint and the point of view of the craftsman-painter. Usually architects and engineers who specified or used paints had neither the exact scientific knowledge of the manufacturer nor the practical experience of the painter. This was to a great extent inevitable when one bore in mind the enormous scope and complexity of the knowledge required of the architect of to-day. Still, there appeared to be a supine or neglectful attitude on the part of many towards paint questions, which, perhaps, accounted somewhat for the lack of proper wording in the framing of paint specifications — the phraseology of which appeared to have remained practically unaltered for two generations at least. Mr. Smith read extracts from a recent paper by Mr. J. D. Crace in support of this view. Mr. Crace advocated the standardizing of workmanship or quality of work, and Mr. Smith laid stress on the necessity of drawing a clear distinction between that part of the specification which related to materials and that part which related to workmanship. This question of standardizing workmanship, he said, was one which related more particularly to the craftsman, and might well form the subject of discussion and action in the distinctively painters' associations. After reference to the extent of the evil of scamping and its relation to the system of competitive tenders and "cutting," Mr. Smith passed on to discuss present-day conditions in relation to the ordinary materials of the painter's craft, and showed that linseed oil, white lead, priming, knotting, copal varnish, &c., were terms having a very elastic meaning. He discussed in detail extracts from actual specifications and schedules, pointing out cases where these documents, as commonly worded, did not protect the person on whose behalf the architect was employed. Standardization was also required in regard to the materials of the paint trade. At present terms and trade names and descriptions were used in a vague way, and matters were little less than elastic. The old-fashioned rules were (1) to purchase goods from a respectable house and (2) to pay a good price for them — good advice, no doubt, but hardly sufficient for modern requirements. Mr. Smith then alluded to attempts made by large buyers of paints, corporations, &c., to protect themselves by buying to specification, and he pointed out how such a plan might defeat its object unless followed with prudence and technical knowledge. On the subject of protective paints Mr. Smith gave some exceedingly interesting information. Recent researches in America, conducted by officials connected with some of the great railroads, had conclusively proved that within certain limits the chemical composition of the paint was not the prime factor that determined durability. It was the physical texture, or, to be more precise, the smallness in size of the particles, that was essential. Mr. Smith quoted details of actual experiments on this subject, and said that the practical result of the investigation was that durability and comparatively low cost were not incompatible. He went on to discuss a number of interesting details, and emphasized the growing need for the standardization of paints—more particularly the protective paints.

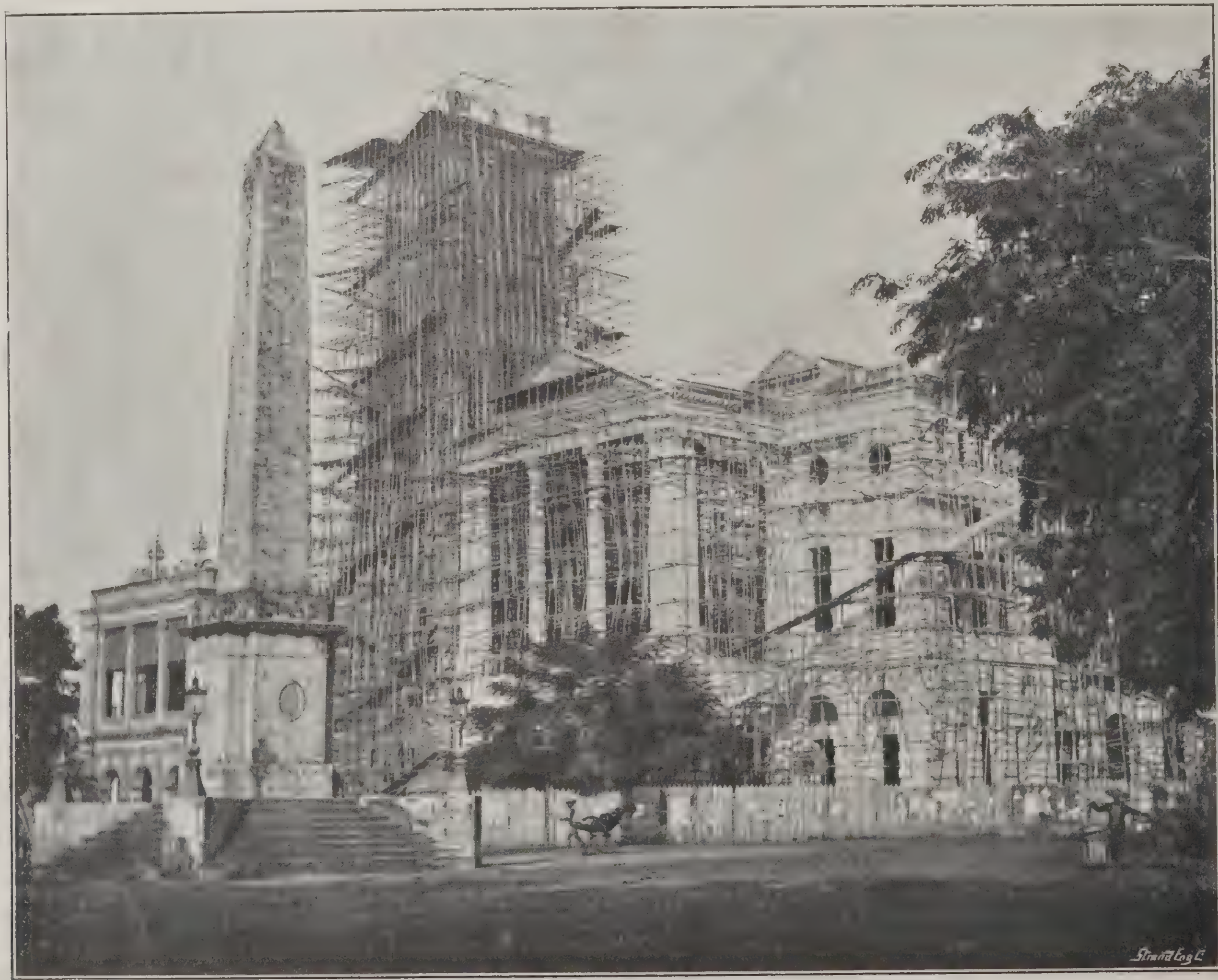
VICTORIA MEMORIAL HALL, SINGAPORE.

THE photograph below of the Victoria Memorial Hall now in course of erection at Singapore is particularly interesting as showing the Chinese method of scaffolding. This, as will be inferred, is of bamboo poles laced together. Particular attention is directed to the runways, which extend zig-zag up the sides of the tower and across the face of the building. These afford a ready, if slow, method of taking up materials as the work proceeds. On these runways it is a common practice to bind short lengths of bamboo in order to afford better foothold. The obelisk seen in the foreground was erected by Chinese and natives to commemorate the occasion of Lord Dalhousie's visit to Singapore. The building on the left is the present town hall, which is to be turned into a theatre and the façade re-erected to harmonize with the Victoria Memorial Hall, which is to be used as the town hall. The building is being erected by public subscription. The foundation-stone was laid by Sir F. E. Swettenham, late Governor of the Strait Settlements. The photograph here reproduced was taken by Mr. H. G. Allen, of Singapore.

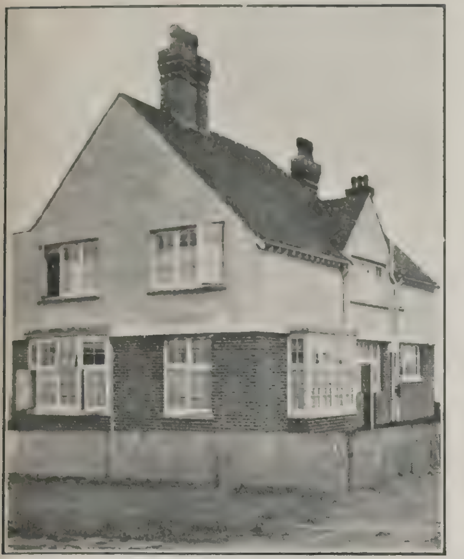
THE USHER HALL, EDINBURGH.

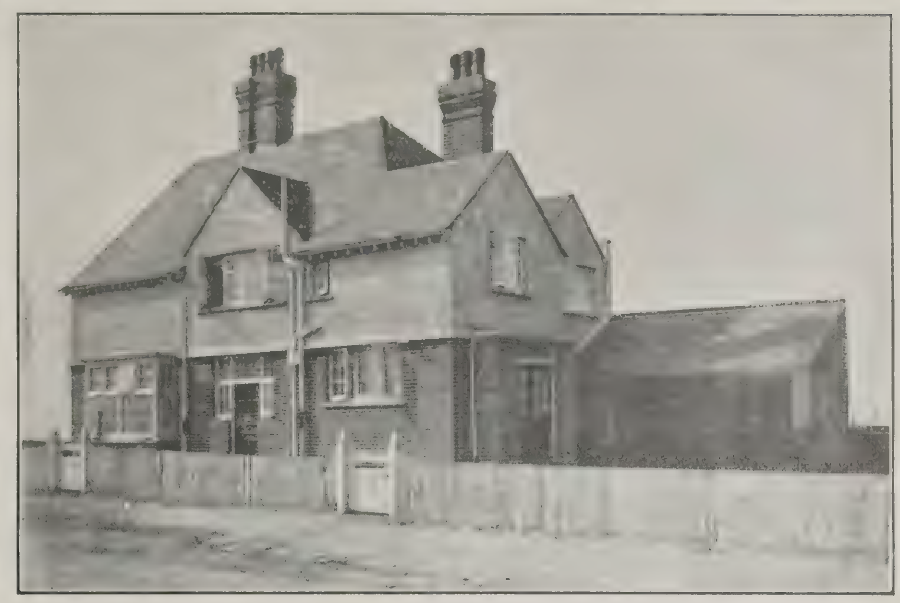
Its Acoustics.

THE proposal to pull down the Synod Hall in order to erect on the site the much-discussed Usher Hall has roused the ire of a large section of Edinburgh citizens, and a public meeting to protest against the proposal was held in the Synod Hall last week. A resolution was passed against the scheme, and a second resolution, respectfully urging on the Town Council the expediency



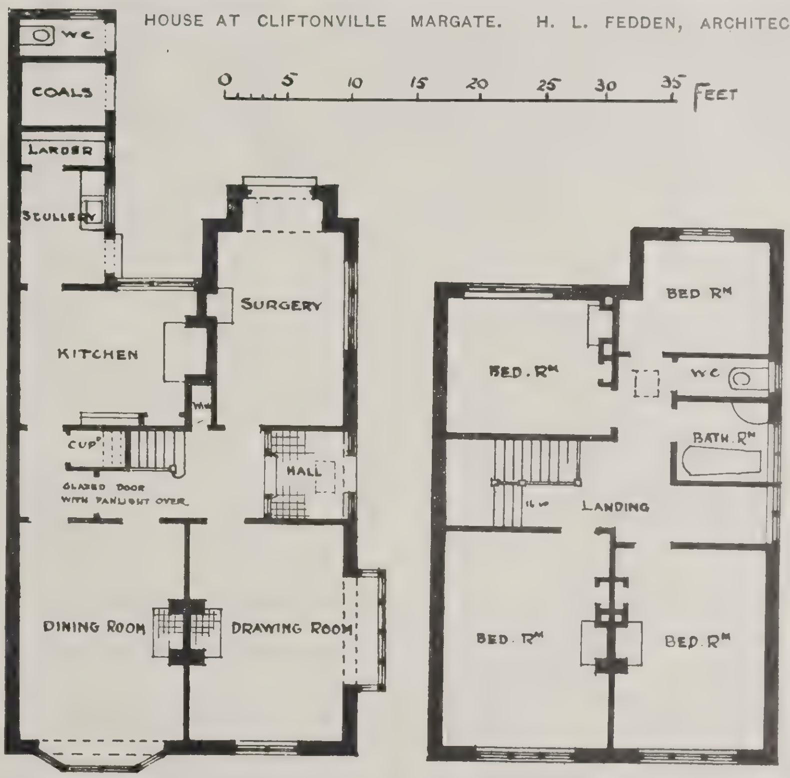
VICTORIA MEMORIAL HALL, SINGAPORE, IN COURSE OF CONSTRUCTION.





of instituting a competition for designs for the proposed hall, was carried on the motion of Prof. Baldwin Brown.

A deputation from the Usher Hall Committee, consisting of Councillor Cameron, Mr. Morham (city architect) and Mr. Williamson (his assistant) recently had a conference at Glasgow with Dr. Joseph Cowen as to the acoustics of the proposed hall. They exhibited to him the amended plan which the city architect had submitted to the Usher Hall Committee, showing extended side galleries. This plan Dr. Cowen condemned for two reasons—(1) that the hearing would be bad, and (2) that the greater portion of the sitters in these galleries would be unable to see the platform. His experience had been that for such a hall shallow side galleries were preferable. In the case of St. Andrew's Hall, those in the back seats of the side galleries could not see the platform. Dr. Cowen expressed his preference for the contract plan, provided there was a plain unbroken ceiling, and that the lunette windows were removed from the cove, as had been suggested by Mr. Cameron. A plain ceiling and cove would be favourable to good acoustics. In regard to the arrangement of seats in the orchestra Dr. Cowen gave valuable information. He suggested 9 sq. ft. for each instrumental performer, that the three lower seats of the orchestral tier should be deep, and that the depth should be diminished as the seats ascended. That was a reversal of the order in the plan. He advised that the seat of the organist should be at least 18ft. above the platform, and that there should be no seats at each side of the organ, as such an arrangement would give the conductor more command over the orchestra He strongly approved, as a matter of detail, a suggestion made by Mr. Cameron that the orchestra recess should be lined with wood. That, in his opinion, would constitute a perpendicular sounding-board for the rest of the hall. The deputation also elicited from Dr. Cowen the view that a somewhat lengthened hall was not a menace to good acoustics. The proposed Usher Hall was 5ft. less in width than the St. Andrew's Hall, but he did not think that diminished width would in any way affect the acoustics, provided always that the ceiling and the cove were kept plain. Dr. Cowen suggested that there should be a centre aisle in the hall, with side passages. That arrangement would not interfere with the architect's seating arrangements, and would be for the great convenience of the audience. The desirablility of having a pitch or rake on at least two-thirds of the area floor was approved by Dr. Cowen. The whole matter will be submitted to the Committee in due course.



HOUSE AT CLIFTONVILLE MARGATE. H. L. FEDDEN, ARCHITECT.

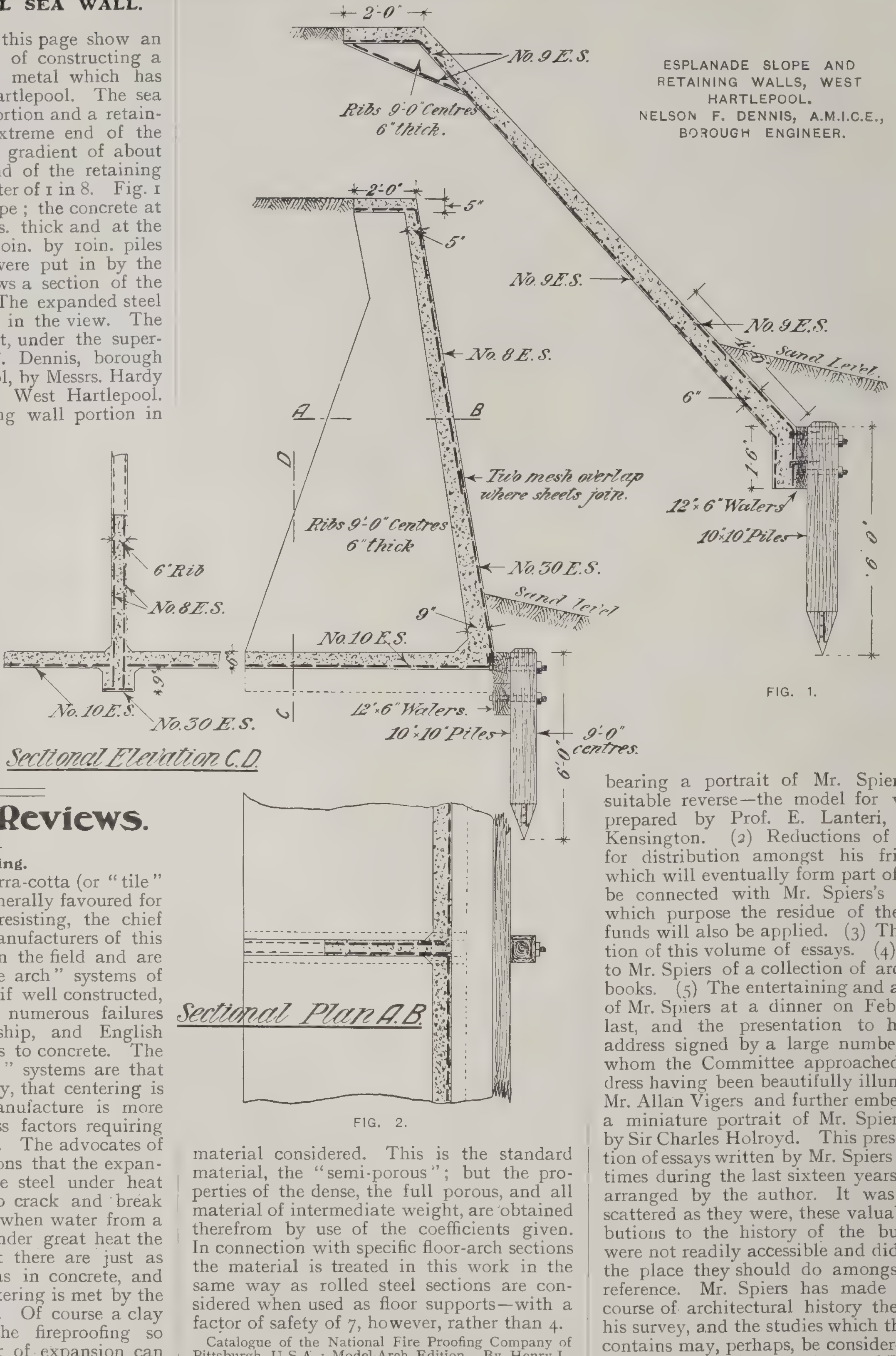
This house was completed about a year ago. The contract price was £750. The external walls are of brick 14ins. thick, rough-casted from the first floor. The roofs are covered with strawberry-coloured Broseley tiles. The house is next High Cliff Hall, on the Lewis estate, and is near the promenade and sea. The architect was Mr. H. Launcelot Fedden, of 11, Hart Street, Bloomsbury, W.C.

Law Cases.

Architects and Committees. — At the Durham County Court recently, before His Honour Judge O'Connor, Mr. J. G. Burrell, a well-known architect and surveyor in Durham City, sued Messrs. W. Willis and J. Lawson, of Langley Moor, for £20 for work done. Defendants were two members of a committee formed in 1901 for the purpose of erecting a temperance club at Langley Moor. Plaintiff applied for the office of architect and was asked how many shares he would take and what would be the extent of his donation. The approximate cost of the building (according to the secretary) would be about £1,200. Plaintiff said that if he received the appointment he would take 100 shares as part-payment of commission and would make a donation of £3 3s. His terms would be 5 per cent. on the total cost. The defendants furnished him with a rough outline, but he said it was impossible to build such a club for less than £2,000. His plans were accepted, but afterwards temporary premises were built, and when he found additions were to be made to these, he sent in his account. Defendants, however, denied liability, arguing that they were simply members of a committee which was afterwards incorporated into a company; so that they could not in equity or law be called upon to pay for the preparation of the plans, as the company had taken the responsibilities which formerly rested on the committee.—His Honour, in giving judgment for the full amount claimed, said that the fact that nothing was said about payment when the defendants visited plaintiff's office had been referred to; but if anyone went to a physician or a solicitor to obtain his advice on important matters, nothing might be said about the charge, but the bill would be sent in just the same. On application he decided that the plans should be retained by the plaintiff's solicitor, who produced them.

WEST HARTLEPOOL SEA WALL.

THE illustrations on this page show an interesting method of constructing a sea wall with expanded metal which has been adopted at West Hartlepool. The sea wall consists of a slope portion and a retaining wall portion, the extreme end of the slope portion being at a gradient of about 1 to 1 and the extreme end of the retaining wall portion having a batter of 1 in 8. Fig. 1 shows a portion of the slope; the concrete at the top of the slope is 5ins. thick and at the toe 6ins. thick. The 10in. by 10in. piles and 12in. by 6in. walers were put in by the Corporation. Fig. 2 shows a section of the retaining wall portion. The expanded steel used in the wall is shown in the view. The work is being carried out, under the supervision of Mr. Nelson F. Dennis, borough engineer, West Hartlepool, by Messrs. Hardy & Atkinson, contractors, West Hartlepool. Fig. 3 shows the retaining wall portion in course of construction. Fig 4 shows the slope in course of construction. The excavation and filling-in is being carried out by the Corporation. It will be observed that the quantity of concrete is materially reduced, and the lateral bond will enable the wall to resist the powerful destructive action of the waves that occurs in the ordinary form of sea wall by reason of a portion being first broken and the rest exposed to undermining and washed away.



ESPLANADE SLOPE AND RETAINING WALLS, WEST HARTLEPOOL.
NELSON F. DENNIS, A.M.I.C.E., BOROUGH ENGINEER.

FIG. 1.

FIG. 2.

Views and Reviews.

Fireproofing.

In the United States terra-cotta (or "tile" as it is called there) is generally favoured for rendering buildings fire-resisting, the chief reason being that the manufacturers of this material were foremost in the field and are well financed. The "tile arch" systems of flooring are also efficient if well constructed, though there have been numerous failures through bad workmanship, and English practice generally inclines to concrete. The advantages of "tile arch" systems are that work can be done quickly, that centering is saved, and that the manufacture is more regular and there are less factors requiring attention to avoid failure. The advocates of concrete raise the objections that the expansion of the clay and the steel under heat causes the clay blocks to crack and break away, that the work flies when water from a hose is turned on, that under great heat the clay fuses or twists, that there are just as many points of failure as in concrete, and that the extra cost of centering is met by the cheapness of the concrete. Of course a clay can be selected and the fireproofing so designed that the danger of expansion can be overcome, but the manufacturer of terra-cotta fireproofing does not pay attention to this point. Terra-cotta is, notwithstanding its faults, a very useful material for light floors and where quick erection is essential. The National Fire Proofing Co. of Pittsburgh, U.S.A., one of the chief makers of clay fireproofing, has forwarded us its new catalogue, which is the first attempt that has as yet been made to consider hollow terra-cotta fireproofing sections from the standpoint of the engineer. Terra-cotta of a definite character, embracing all the factors necessary in fire-resisting construction, established by a great number of impartial tests made at the School of Mines, Columbia University (weight 051 lb. per cub. inch) is the special material considered. This is the standard material, the "semi-porous"; but the properties of the dense, the full porous, and all material of intermediate weight, are obtained therefrom by use of the coefficients given. In connection with specific floor-arch sections the material is treated in this work in the same way as rolled steel sections are considered when used as floor supports—with a factor of safety of 7, however, rather than 4.

Catalogue of the National Fire Proofing Company of Pittsburgh, U.S.A.: Model-Arch Edition. By Henry L. Hinton, engineer to the Company.

Mr. Spiers's Testimonial.

This volume is the outcome of a meeting in the spring of last year of old friends and pupils of Mr. R. Phené Spiers for the purpose of initiating a movement to recognize in some tangible form the important services rendered by him during the last twenty-five or thirty years in acting as the friend and adviser of architectural students of various nationalities and helping to raise their ideals of architecture, and also to show an appreciation of the value of his published contributions to the archæology and literature of architecture. The recognition has taken the following forms:—(1) A bronze medallion bearing a portrait of Mr. Spiers, with a suitable reverse—the model for which was prepared by Prof. E. Lanteri, of South Kensington. (2) Reductions of the same for distribution amongst his friends, and which will eventually form part of a prize to be connected with Mr. Spiers's name, for which purpose the residue of the collected funds will also be applied. (3) The publication of this volume of essays. (4) A present to Mr. Spiers of a collection of architectural books. (5) The entertaining and acclaiming of Mr. Spiers at a dinner on February 27th last, and the presentation to him of an address signed by a large number of those whom the Committee approached, this address having been beautifully illuminated by Mr. Allan Vigers and further embellished by a miniature portrait of Mr. Spiers painted by Sir Charles Holroyd. This present collection of essays written by Mr. Spiers at various times during the last sixteen years has been arranged by the author. It was felt that, scattered as they were, these valuable contributions to the history of the building art were not readily accessible and did not take the place they should do amongst works of reference. Mr. Spiers has made the whole course of architectural history the object of his survey, and the studies which this volume contains may, perhaps, be considered as supplementary to his own edition of Fergusson's "History of Architecture." The essays are as follows:—(1) Mahometan architecture: (2) Stalactite (honey-comb) vaulting: its origin in Saracenic architecture; (3) Sassanian architecture; (4) review of M. Dieulafoy's work on the explorations at Susa, 1893; (5) on the influence of Byzantine art in Italy from the fifth to the twelfth centuries; (6) Saint-Front of Périgueux, and the domed churches of Perigord and La Charente; (7) Notes on some churches in Palestine and Sicily; (8) The Great Mosque of the Omeiyades, Damascus; (9) The influence of Greek Art on the Persian order.

"Architecture East and West": A Collection of Essays by R. Phené Spiers, F.S.A., F.R.I.B.A. London: B. T. Batsford, 94, High Holborn, W.C., price 12s. 6d. nett.

OBITUARY.

Mr. George Edward Lowry, of the firm of Messrs. J. & W. Lowry, builders and contractors, of Newcastle, died suddenly on February 27th while at lunch. He was 39 years of age, and was well known amongst builders, architects and contractors in the North of England. His most important recent works were the erection of the Laing Art Gallery, the rebuilding of the Exchange Hotel in Grey Street, and the Sun Insurance offices in Collingwood Street, Newcastle.

Mr. Cuthbert Brodrick died suddenly last week from pneumonia at his residence in Jersey, aged 83. Mr. Brodrick was a native of Hull, and was the architect of the Leeds Town Hall, the Hull Town Hall, the Leeds Corn Exchange and the Grand Hotel, Scarborough. On retiring from practice he devoted his time to art, and many of his paintings were exhibited in Paris.

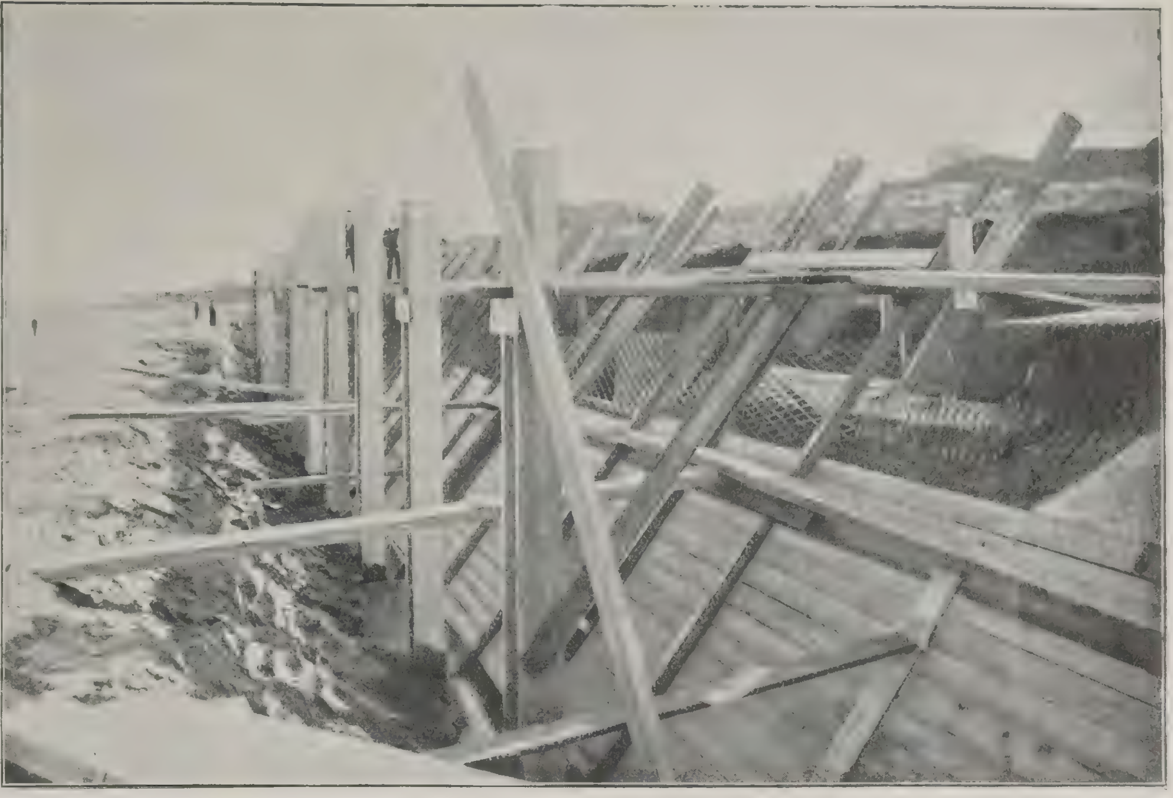


FIG. 4.—ESPLANADE WALL, WEST HARTLEPOOL, IN COURSE OF CONSTRUCTION.

Builders' Notes.

The Tariff Commission has examined the following witnesses (among others) during the last fortnight:—Granite trade, Mr. John Fyfe, Aberdeen; wallpaper trade, Mr. W. B. Huntington, chairman of the Wallpaper Manufacturers (Ltd.) and Messrs. C. & J. G. Potter, Darwen. The Commission has now held ninety-three sittings and examined 208 witnesses, representing the following industries (among others):—Iron and steel, textile, engineering and machinery (including electric engineering, hydraulic and mechanical engineering, and woodworking machinery), glass, timber, building, cement, slate, granite, furniture, brush and wallpaper. In addition to evidence of witnesses, the Commission has received written communications from upwards of 14,000 firms and associations of manufacturers, merchants and others concerned in the trade of the country.

Messrs. Doulton & Co., Ltd., of Lambeth, have been selected to supply the whole of the sanitary fittings and to carry out the plumbing work at the sanatorium now being erected for His Majesty the King at Midhurst, Sussex, from the designs of Mr. H. Percy Adams, F.R.I.B.A., of 28, Woburn Place, W.C.

The British Uralite Co., Ltd., of 50, Cannon Street, E.C., send us a catalogue containing numerous illustrations of buildings in which Uralite has been employed for such purposes as roofs, ceilings, partitions, exterior and interior walls, door panels, &c. The illustrations range from palatial city offices to small colonial bungalows, and from huge tea-plantation buildings to fowl-houses and meat safes, affording unmistakable evidence of the progress which the material has made in the building world. The letterpress is commendable for its brevity. All who are interested in fire-resisting building construction should write for a copy of the catalogue. They can read it without feeling tired.

Builders' Clerks' Benevolent Institution.—The report for the past year shows that the receipts amounted to £777 4s. 4d. The expenditure included a sum of £606 devoted to pensions of £24 each to twenty-four widows and of £30 to one aged clerk. A sum of £5 was granted for temporary relief, and payments were made towards the support of two orphans. Mr. J. Carmichael has been elected president for the current year.

The London Building Acts Amendment Bill and the Bill promoted by the Corporation for providing means of escape from fire in City buildings were opposed last week on second reading in the House of Commons, and they accordingly stand over until Tuesday next, March 14th, at 9 p.m.—At the Guildhall

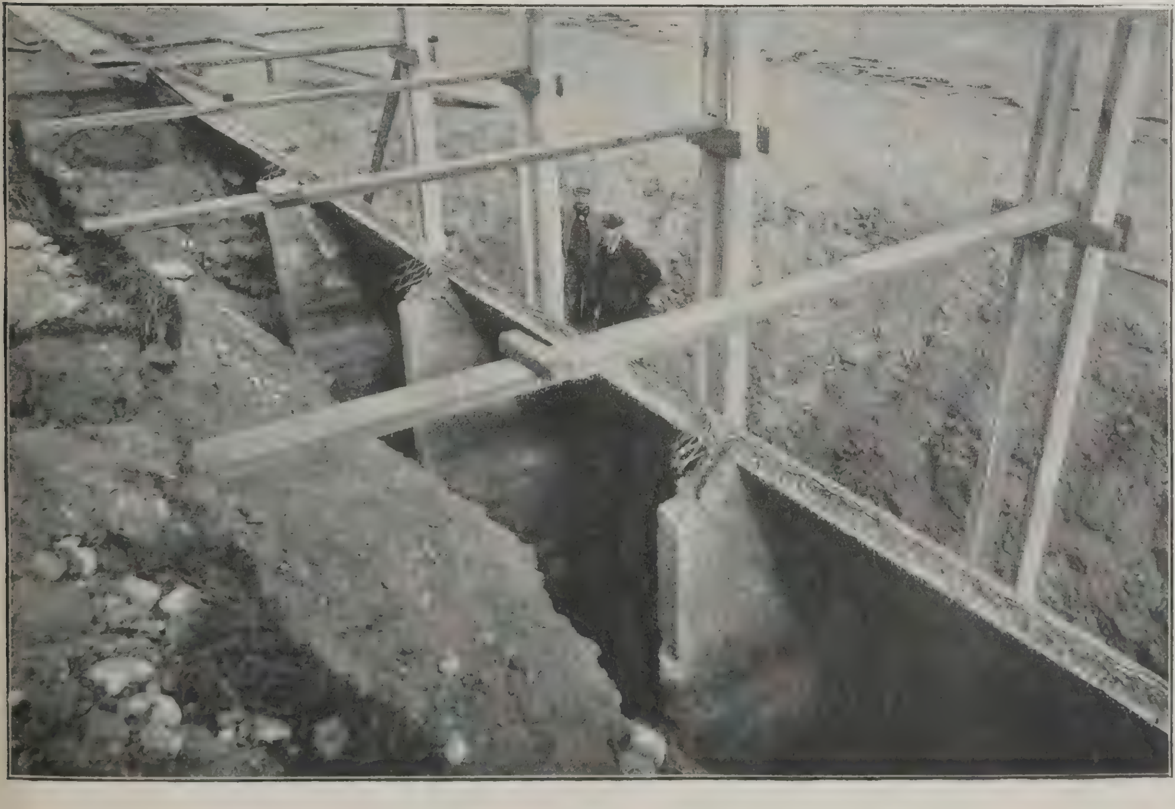


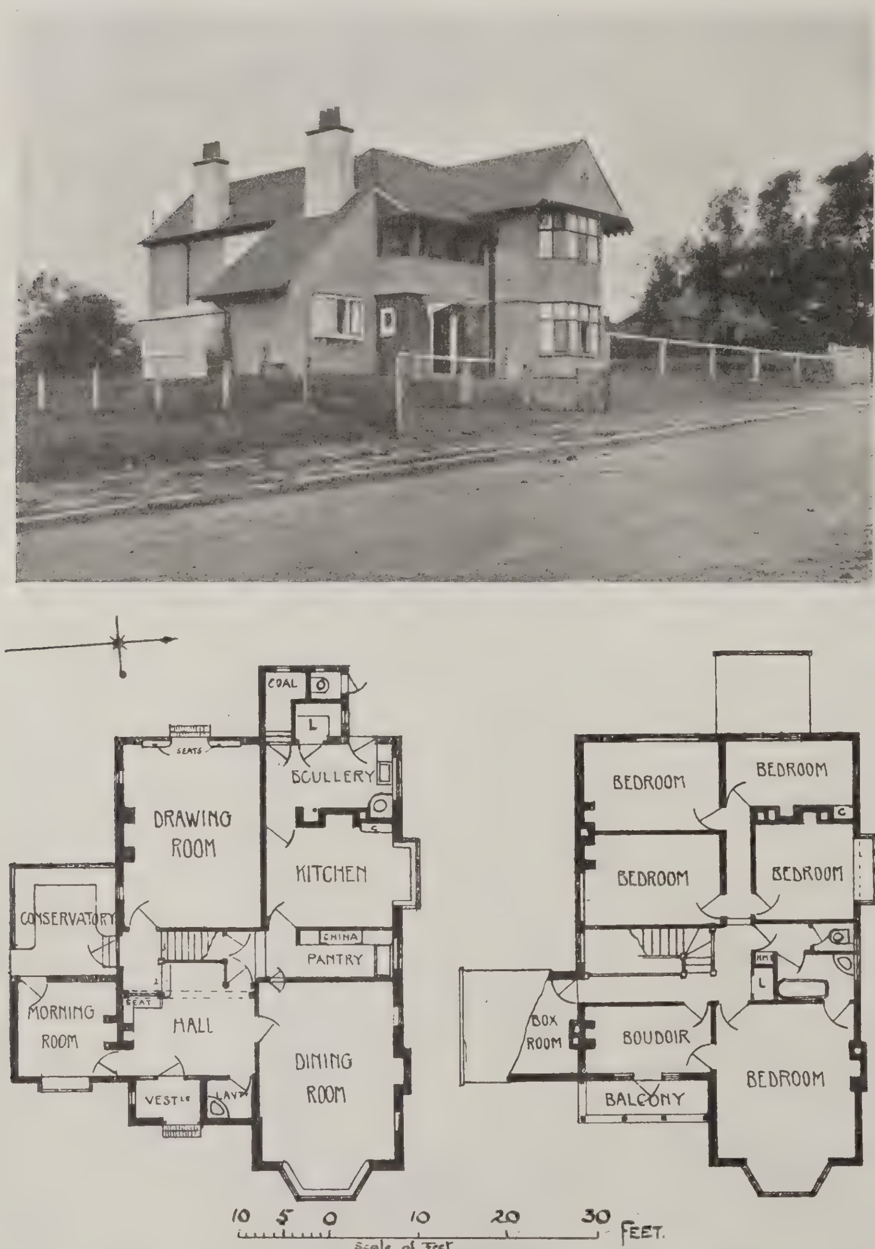
FIG. 3.—VIEW OF ESPLANADE WALL FROM BACK, SHOWING RIBS.

meeting on Friday resolutions were passed condemning the Council's Bill and expressing the opinion that any proposed alterations or amendments to the London Building Acts should be submitted to the local authorities before being presented to Parliament.

A Crane Accident.—On Wednesday last a large crane used in hoisting masonry at the new Waldorf Theatre, Strand, snapped as a ton of stone was being hoisted to the top of the building. The stone fell with a crash into the roadway, but, fortunately, there was no one standing or passing underneath it at the time. Two men, however, who were in the act of receiving the masonry were injured.

Sheffield Master-Builders' Association.—At the annual dinner held last week Mr. J. D. Cook said that during the long spell of bad trade the National and Yorkshire Federations of Building Trade Employers had not endeavoured to reduce the wages of the workmen, and had endeavoured to give a fair day's pay for a fair day's work. The bright star of conciliation was in view to-day, and he hoped that strikes and lock-outs would soon be things of the past. Alderman Jessop, ex-president of the National Federation, said it was important just now to carefully watch affairs in Parliament, for a Bill was to be introduced which proposed to fix a minimum wage. Unless a stipulation were made that the employees should also give a fair day's work, such legislation would be altogether unfair. The National Council were endeavouring to bring about a closer union with the operatives, in the hope that, by means of conciliation boards, strikes and lock-outs might be prevented in future.

English versus Norwegian Granite.—In the course of the arbitration proceedings last week at Exeter between the Government and the representatives of the Calmady-Hamlyn Estate in regard to the proposed acquisition by the former of a tract of land on Dartmoor for military purposes, Sir John Jackson gave evidence. He stated that he had used large quantities of granite in connection with contracts for public works which he had undertaken during the past seven or eight years. At the Keyham extension works he had used 2,500,000 cub. ft. of granite, of which 60 per cent. was obtained from Cornwall, 36 per cent. from Norway and 4 per cent. from Dartmoor. Whilst Norwegian granite was brought into England in comparatively small quantities prior to ten years ago, during the last ten years it had been imported to such an extent that it had absolutely done away with the British granite trade where the stone was required in large quantities. Asked what advantages the Norwegians had, Sir John Jackson said that the granite was of the best, could be shipped direct from the quarry, and there was very little waste. Moreover, "they have more efficient men working in Norway at half the pay. I do not say they work better; they work more regularly. Englishmen go off drinking so often. The Norwegian takes a fortnight about once a year, drinks for a fortnight, and has done with it. The consequence is the work goes on more regularly." People who put money into granite quarries in England were simply throwing it into the sea. The cost of carriage from Norway was 8s. or 10s. a ton.



HOUSE AT WESTCLIFF-ON-SEA. DOUGLAS H. SMITH, ARCHITECT.

This house has recently been erected for Mr. H. J. Cullum. The materials employed are cement rough-cast coloured a medium buff, local red brick facings, with a roof of bright red Essex sand-faced tiles. The hall and dining-room are panelled in dark oak. The architect was Mr. Douglas H. Smith, and the contractors were Messrs. Whur & Campkin, of Southend-on-Sea.

"Sanalene" is the latest introduction of Messrs. Aspinall's Enamel, Ltd. It has a very fine surface, will not crack or peel off, is non-poisonous, and can be obtained either as a glossy or flat enamel. Samples can be obtained from the makers, whose address is New Cross, London, S.E.

Building Trade Dispute in Dublin.—A dispute has arisen between the Brick and Stonelayers' Society and the Master-Builders' Association of Dublin in reference to piecework, and the master-builders have decided on a lock-out. This affects 2,000 men—700 Society members, 300 carpenters and 1,000 builders' labourers. The dispute appears to be due to an unwritten rule of the men's society that their members were free to do work by piecework or measurement for any persons who were not regular builders, with the result, as the masters affirm, that such persons can do speculative house-building work at prices that the regular builders could not, and in consequence a very large amount of work of this class has passed out of the hands of the regular builders. The men have passed a resolution "that piecework, especially sub-contracting, is an injustice to the general public, as it would establish a sweating system, and, as a result, bad workmanship, which, in the building trade, means a source of danger to public life and interest, and in view of the attitude of the various public bodies we consider it hostile to public reform."

Testing a Concrete Floor.—A floor at the new Wesleyan Sunday School, King Cross, Halifax, constructed by Messrs. Stuart's Granolithic Stone Co., Ltd., of London, E., was tested recently. (The company has just removed its Manchester offices from 49, Deansgate to Great Bridgewater Street.) The gallery classrooms of the school, 12ft. by 11ft., are covered with one slab of concrete 4ins. thick without any intermediate steel girders. Some doubt had been expressed as to the adequate strength of these floors, and in order to satisfy the Corporation authorities the contractors requested the building inspector (Mr Goldthorp) to select any floor. Mr. Goldthorp selected a slab in a balcony passage at the rear of the school, the dimensions of the slab being 9ft. 4ins. by 3ft. 6ins. and 4ins. thick, supported at each end by a steel girder and on one side by a wall, the outer edge being entirely unsupported. This slab was weighted with thirty-one 2 cwt. sacks of cement, representing (with the weight of the floor) an actual load of $2\frac{1}{2}$ cwts. per sq. ft. At this weight the deflection at the centre was not more than $\frac{1}{16}$in., and when the load was removed the slab resumed its normal position. As this weight represents more than double that of a closely-packed crowd of men, and the slab selected was admitted to be the weakest in the building, all fears as to the strength of the other floors were set at rest. The test took place in the presence of Messrs. Leslie, Munro and Athol Stuart (representing the company), Mr. Goldthorp, and Mr. A. G. Dalzell, the architect, all of whom were perfectly satisfied with the result.

Keystones.

Mr. Edwin T. Hall, F.R.I.B.A., has been elected deputy-chairman of the Board of Estates Governors of Dulwich College.

New Banking Premises at Plymouth for the Capital and Counties Bank, Ltd., have been erected from designs by Mr. A. G. Bewes, A.R.I.B.A.

Ritz Hotel, Piccadilly.—The name of Mr. John P. Bishop, A.R.I.B.A., should be coupled with that of Messrs. Mewes & Davis as architects of this hotel.

Fotheringhay Church has been reopened after restoration of the clearstory and parapets of the nave roof and the repair of the oak roof of the nave. £5,000 is still required to complete the work of preservation.

Messrs. Norton & Gregory, Ltd., of Castle Lane, Buckingham Gate, S.W., have issued a very neat booklet dealing with their "permanent black line," sepia, cyano, ferro-gallic and ferro-prussiate processes of photo-copying; also their drawing materials and furniture, and double-action spring hinge.

Suffolk County Hall.—It has been decided that the new council-chamber in the county buildings at Ipswich shall be built of Suffolk oak. It was recently proposed that the county hall should be built entirely of this material by means of each Hundred contributing one oak tree, but it was found that this could not be carried out.

The old Proposals for Restoring the Parthenon appear to be reviving in some quarters. At all events, they have taken the alarm in Paris and a formal protest has been drawn up and is to be placed in the hands of the president at the forthcoming Archæological Congress in Athens, with a request that he will transmit it to the King.

A Skyscraper Church—the Broadway Tabernacle—has been erected at the corner of Broadway and Fifty-seventh Street, New York, on a lot 100ft. by 100ft. The building is of steel construction ten storeys high. While the general design is of an ecclesiastical character, the building has numerous classrooms, a library, baths, gymnasium and kitchen—all necessary adjuncts of church work in America.

Islington Library Competition.—The following ten architects have been nominated to compete for the new central library for Islington:—Messrs. Reginald Blomfield, William Flockhart, Henry T. Hare, Mervyn Macartney, Philip A. Robson, A. W. S. Cross, Sydney K. Greenslade, Arthur Keen, Leonard Stokes and Prof. Beresford Pite. An honorarium of £20 will be paid to the unsuccessful competitors, except those appointed for the branch libraries.

Glasgow Institute of Architects.—At the recent quarterly meeting of this Institute the following clause in regard to repairs after electrical work, proposed by the Institute of Measurers for embodiment in specifications of contracts, was approved:—"The contractor to do all mason, brick, joiner, plaster and other works required to carry out and complete his contract, and to make good at his own expense all damage caused by his operations, and he shall be bound to employ the plasterer engaged on the job at the usual jobbing rates." It was agreed to inform the R.I.B.A. that this Institute would be glad if, by putting a clause in the schedule of professional practice as to charges, or in some other way, all doubt as to the ownership of drawings could be removed. It was remitted to the Council to draw up a form of recommendation to the members of the Institute regarding the joint-diploma in architecture recently established by the Glasgow School of Art and the Technical College.

Charing Cross Railway Bridge is to be widened.

The Tower of St. George's Church, Ramsgate, is in a dangerous condition of decay, and a scheme of restoration (estimated to cost £4,800) is now on foot.

Messrs. Oetzmann & Co. have purchased the entire stock of Messrs. Norman & Stacey, Ltd., of 252 to 256, Tottenham Court Road, and are now removing it to their own showrooms and galleries at 62 to 79, Hampstead Road.

Sanitation of Country Houses.—In our report of the paper on this subject read before the last meeting of the Architectural Association we gave the author's name as Mr. J. Osborne Smith, A.R.I.B.A., whereas it should have been Mr. Frederick J. Osborne Smith, A.R.I.B.A., F.R.S.I. We regret the error.

Mr. John Belcher, A.R.A., has designed a large palm house, bandstand and ornamental fountain, which is to be erected in Williamson Park, Lancaster, at a cost of between £5,000 and £6,000. The building will be 120ft. high, with terraces, balconies and turrets, and an octagonal dome. This is to be Lord Ashton's gift, in addition to his recent offer of a new town hall and other buildings costing £100,000.

Partnership Assurance.—A pamphlet by Mr. T. P. Wansbrough on "The Case for Partnership Assurance" has been issued by Messrs. Charles & Edwin Layton, Farringdon Street, E.C., price 1s. 6d. The death of a member of a firm occasions such monetary inconvenience and not infrequently financial disaster to the remaining members that any serious attempt to solve the difficulties of the subject is one of general interest. Mr. Wansbrough exposes the inadequacy of elaborate clauses in partnership deeds, and shows that the only method by which the rival claims can be fully safeguarded is assurance.

Snow Houses.—Mr. F. G. Speck explains in a paper that the houses of the Eskimo are built of snow blocks cut into cakes of the required size; the ground plan laid out in the form of a circle. Now the blocks, beginning from a certain point in the circumference of the base, are cut gradually of less height, so that when the same place is reached in laying the first course the last blocks are so small that they stand merely a few inches above the ground. The simple principle is that of a spiral. Each course is laid on the former till the vault begins to assume definite form. The process is continued, the walls slanting towards the geometrical centre till the keystone is ready to be placed. No scaffolding or support is used.

Berlin's New Cathedral has been ten years in building. The site is close to the eastern arm of the Spree and necessitated extensive piling. The cathedral is built of Silesian grey sandstone in the style of the Italian Renaissance, and has a central cupola with cross reaching to a height of about 374ft.—nearly 79ft. less than St. Peter's, Rome, and over 9ft. more than the height of St. Paul's. The total length of the building is 374ft., and its breadth nearly 80ft. The chief façade and the main entrance on the west side are characterized by an elaborate arrangement of columns and entablature, which is repeated in the second storey supporting the central dome, the dome itself flanked by four minor cupolas surmounting open square towers, the cornices of which are also supported on columns. Over the arch of the great portal is a colossal statue in bronze by Schaper representing Christ in the attitude of benediction. The cathedral has cost £500,000 (voted by the Prussian Diet) and represents the first Protestant Dom erected in modern Germany. The architect, Herr Raschdorff, has been decorated by the Kaiser.

The Old Kent Road Fire Station, just rebuilt upon an enlarged scale by the Works Department of the London County Council, has cost £10,650, with £1,320 for additional land.

Alarming Reports about the Monument in the City of London have been circulated. It has been stated that there is a crack of 6ins. in the abacus, but the fact appears to be that this is but an opening where the cement has worked out. The three horns of the copper dragons, however, seem to be in a dangerous state.

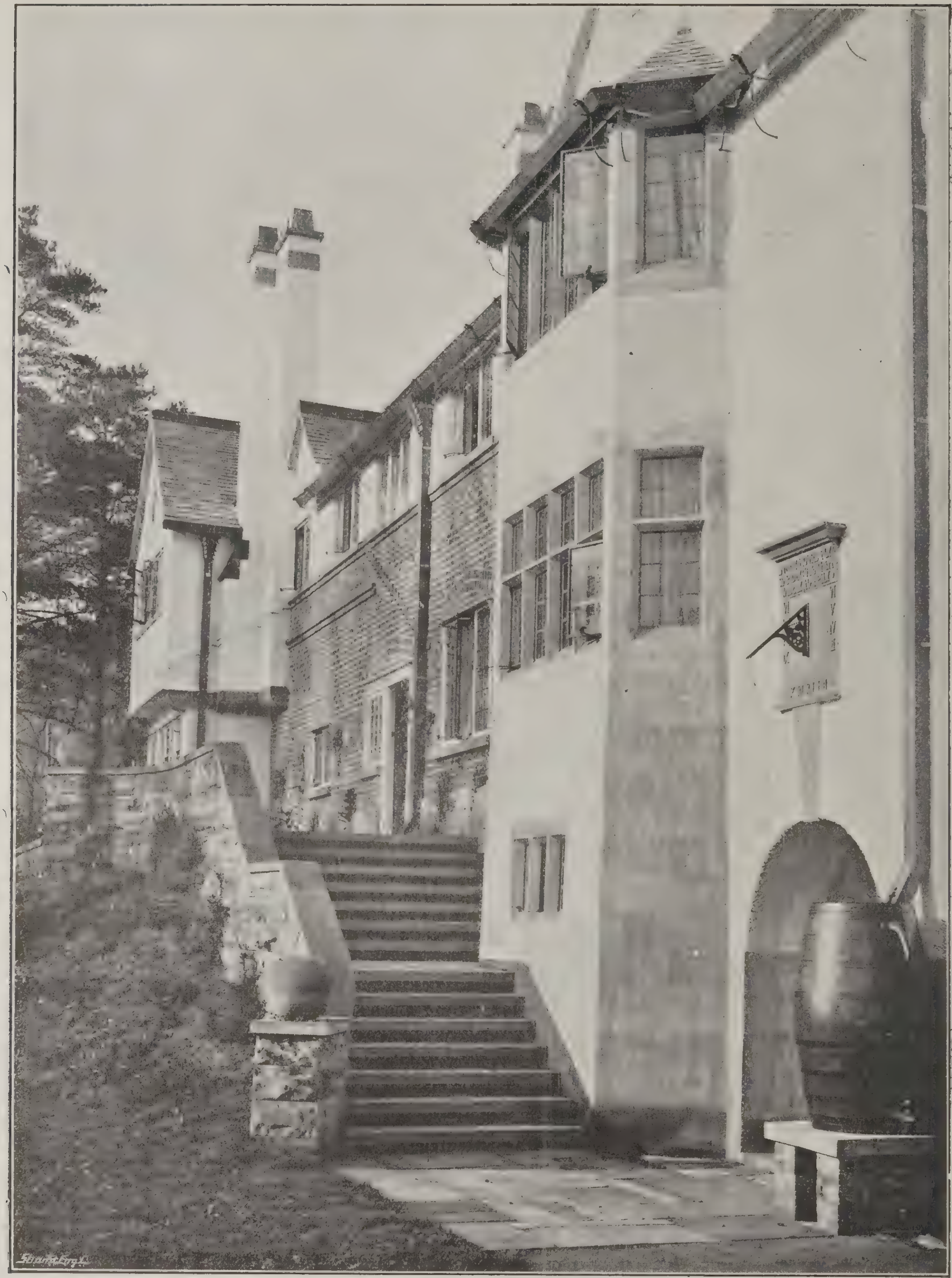
Costly Street Widening.—The Kensington Borough Council has decided to widen Church Street and Silver Street, leading from Kensington High Street to Notting Hill Gate, at an estimated cost of £285,000. The thoroughfare will be made 54ft. wide. The borough council has consented to pay one-third of the nett cost of the improvement.

Alnwick Infirmary Competition.—Mr. Frank Caws, F.R.I.B.A., the assessor in this competition (limited to architects in Northumberland and Durham), has awarded the first premium of £100 to Mr. Douglas, of Alnwick, and Messrs. Boyd & Groves, of Newcastle, joint architects; the second premium of £30 being divided between Mr. Stephen Piper and Messrs. Armstrong & Wright, of Newcastle.

Registration.—On February 27th Mr. A. W. S. Cross and Mr. George Hubbard, members of Council of the R.I.B.A., read papers on "Registration" before the Bristol Society of Architects. A discussion followed and a resolution was carried unanimously "That this Society, having heard the respective papers of Prof. Beresford Pite on one side and of Messrs. Cross & Hubbard on the other, is distinctly in favour of the principle of the statutory qualification and registration of architects." On Thursday Mr. Cross and Mr. Hubbard put their views before the Sheffield Society of Architects and Surveyors, when a resolution was passed "that the Society again affirms the necessity for the statutory qualification of architects, and trusts that a satisfactory Bill will be put forward as soon as possible."

Northern Architectural Association.—At the last meeting of this Association Mr. W. H. Wood (of Messrs. Oliver, Leeson & Wood) delivered a lecture on "The Design and Construction of the Spire of Newcastle Cathedral." Mr. Wood said this was of Scottish form, and there were only four other known examples—St. Giles's, Edinburgh; King's College, Aberdeen; one at Linlithgow, and one in London, by Wren. St. Nicholas's was infinitely the most elegant example of them all; it was repaired at various times—by Sir Gilbert Scott (who put in entirely new foundations and effected a lot of tying up, necessary for the big arches to carry the lantern), and lastly in 1895 by Messrs. Oliver, Leeson & Wood, when portions of the pinnacles were rebuilt and the vane was re-made.

The latest Skyscraper is the "New York Times" building. It measures 419ft. 9ins. over all. The Park Row building is 410ft., but is higher from the pavement level, being 380ft., while the "Times" building is 362ft. 8ins. This building is notable in more ways than one, however. It faces four streets on a site comprising 5,405 sq. ft. The New York subway traverses one corner of the upper basement, and a local station at this point permits the tenants of the building to enter the subway without going on the street. The building has a total floor space of 116,349 sq. ft, 3,712 tons of structural steel, a smokestack 389ft. high, a 30-ton steel girder (the heaviest girder ever used in the construction of an office building), an elevator rise of 326ft., and many other noteworthy features.



WOODGARTH" KNUTSFORD, CHESHIRE: SOUTH FRONT AND TERRACE STEPS FROM PERGOLA.
THOMAS AND PERCY S. WORTHINGTON, ARCHITECTS.

OUR PLATES.

"WOODGARTH" has been built for Mr. George Wragge on the outskirts of Knutsford, a small Cheshire town to which Cranford has assigned a niche in literature. A wood of firs and beeches, oaks and birches has been sufficiently cleared to receive the house and forecourt, and the plan shows how the south front overlooks a sunk garden that was originally a large sand-pit, from which steps lead up to the terrace and down to a grass path along a wooded ravine. A pergola follows the curved line of the sand-pit, with a thatched garden-house in the centre. This arrangement allows the blooms of roses and climbers, so often visible on a pergola, to be seen from the windows of the house. Externally the walls of the house are rough-casted, with base and dressings of Alderley stone, and the roofs of stone tiles. The gutters and down-spouts are of English oak, and the heads have each a carved panel and angles decorated with diaper patterns. Internally, the woodwork on the ground floor and staircase is of oak in panelling, floors and doors, &c., and the plaster decorations have been modelled from the architects' design by Mr. Miller, of Messrs. Earp, Hobbs & Miller. The general contractors were Messrs. Isaac Massey & Sons, of Alderley Edge. The metal-work in iron, copper, brass and lead, and the casements, glazing and decorative colouring, have been done by Mr. Wragge himself. The house has been built from the designs and under the superintendence of Mr. Thomas Worthington and Mr. Percy Scott Worthington, architects, of Manchester.

The East Ham Technical College and Secondary Day School adjoining the Town Hall is to be opened by the Prince of Wales on March 18th. The building has cost £24,000.

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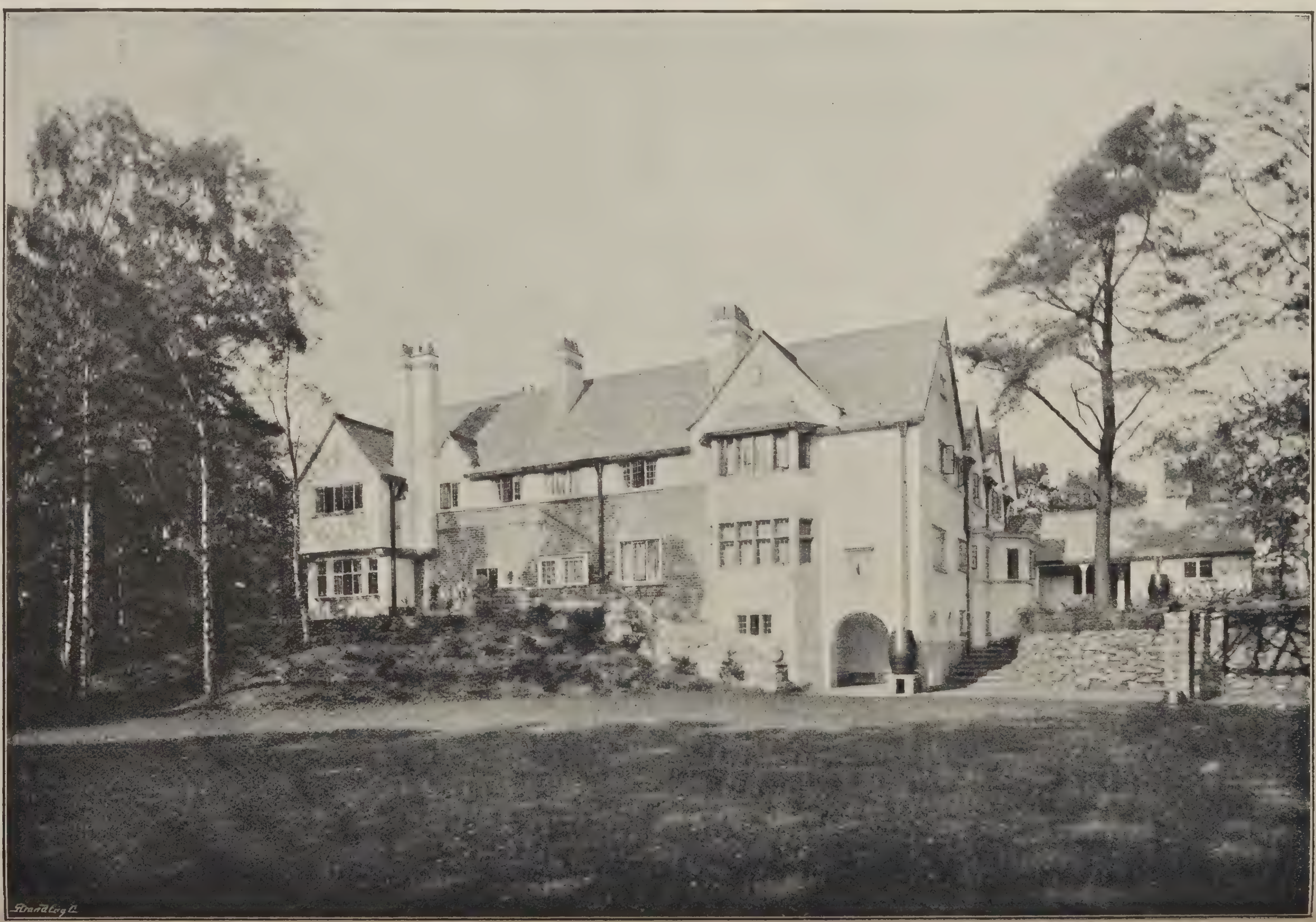
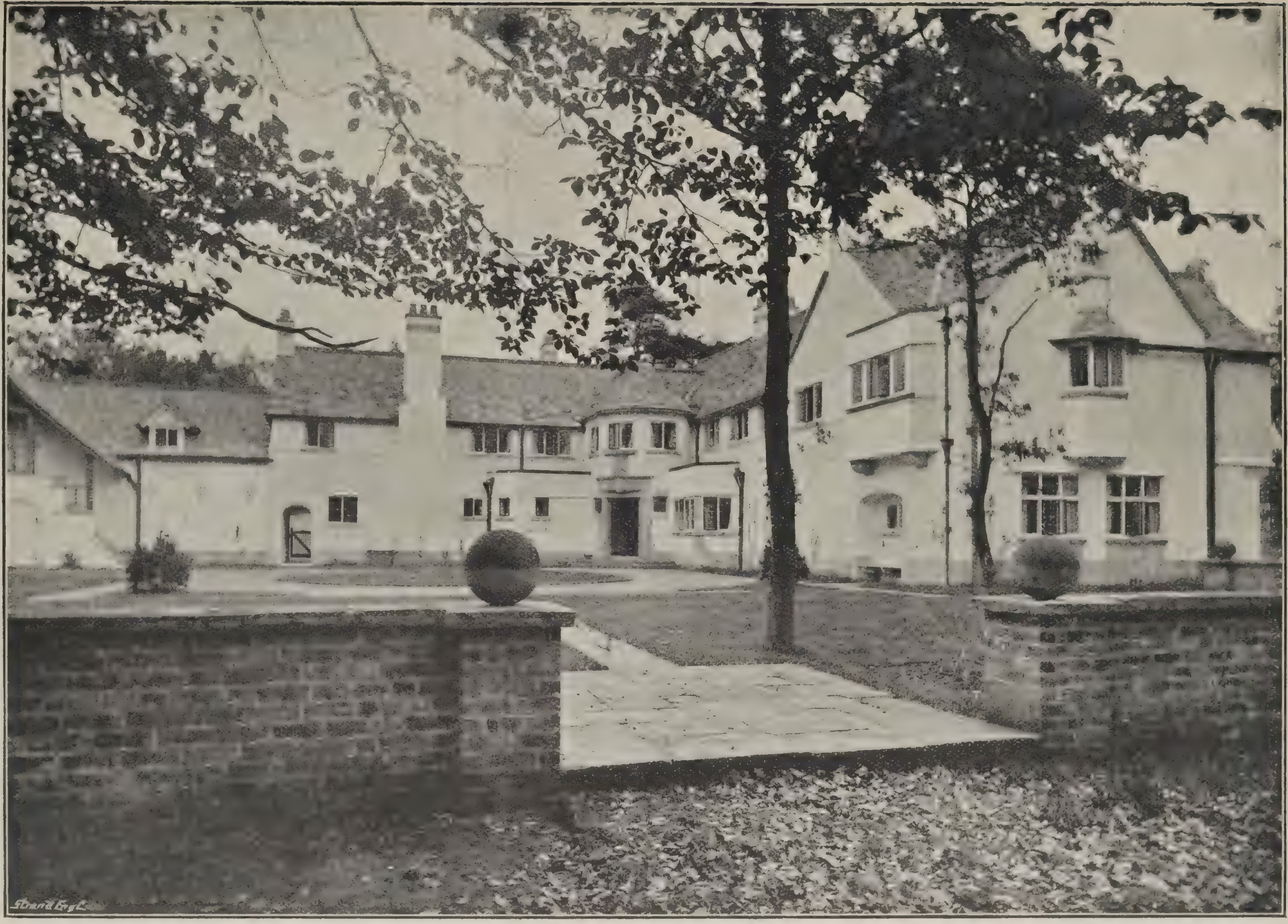
Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, March 8th, 1905.





ENTRANCE COURT.

"WOODGARTH," KNUTSFORD, CHESHIRE. THOMAS AND PERCY S. WORTHINGTON, ARCHITECTS.

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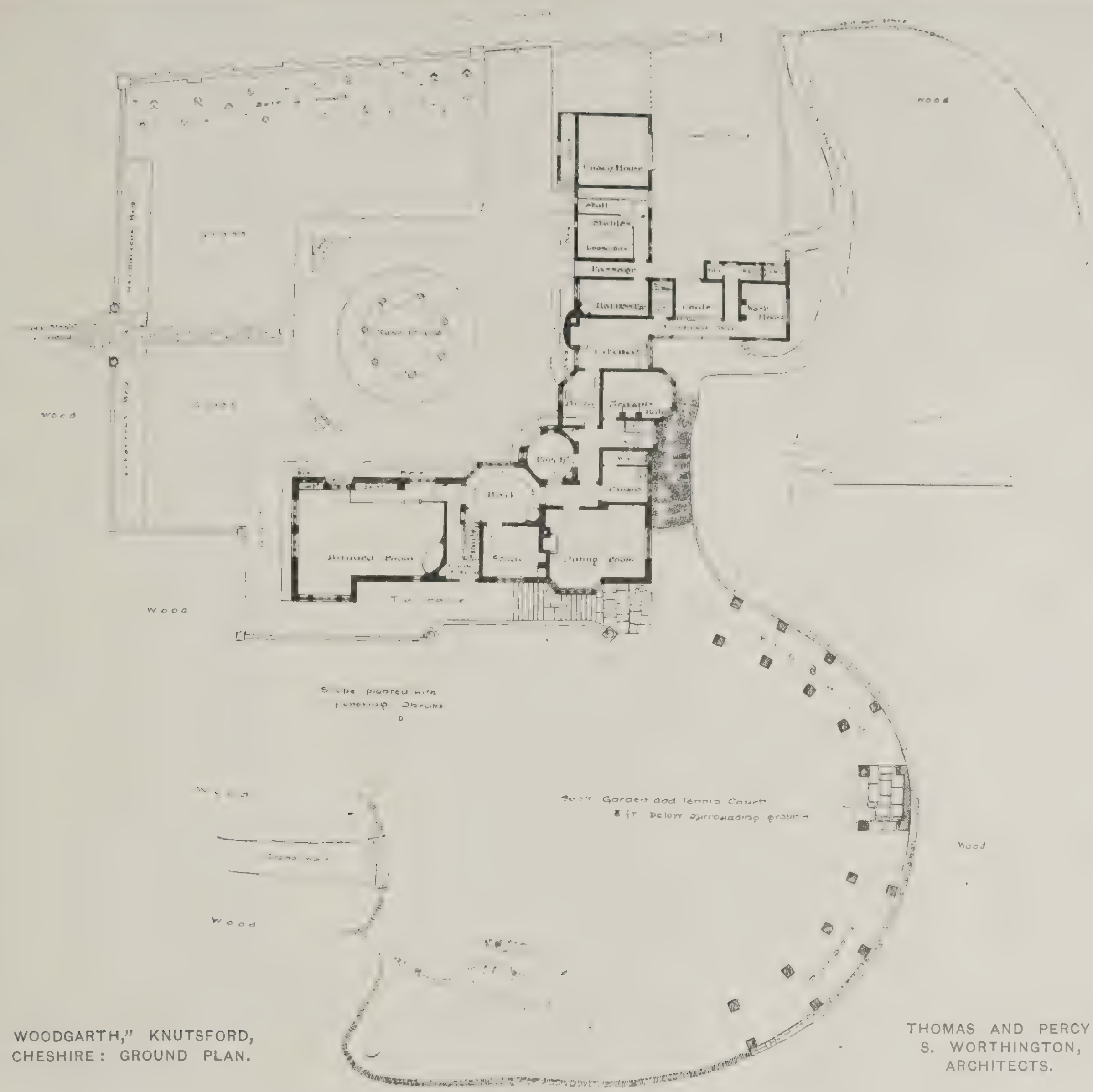
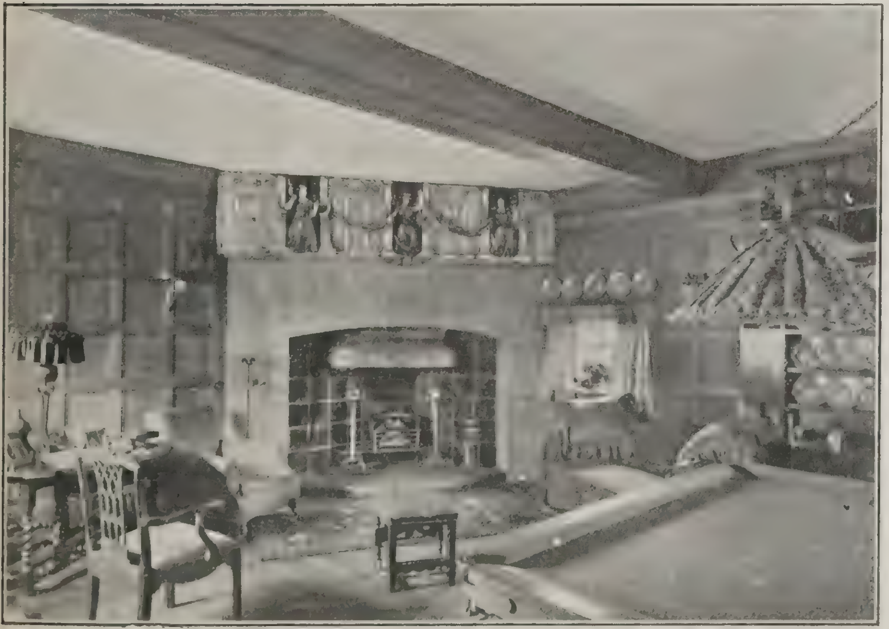
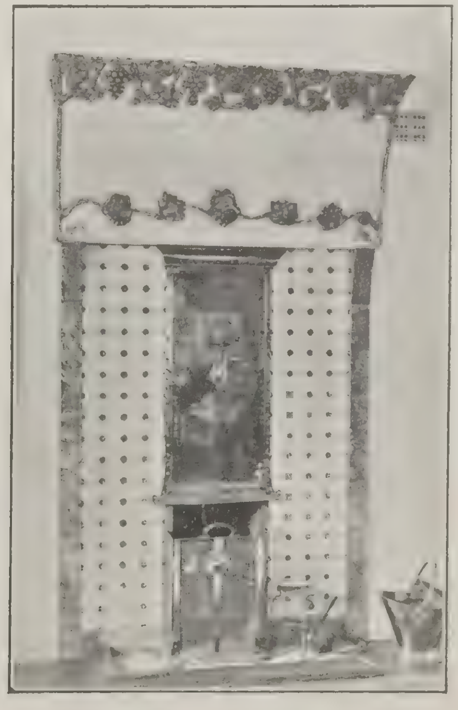


WOODGARTH," KNUTSFORD, CHESHIRE: GROUND PLAN.

THOMAS AND PERCY S. WORTHINGTON, ARCHITECTS.



LIVING- AND BILLIARD-ROOM.



DINING-ROOM FIREPLACE.

THE TIMBER TRADE.

London Market in February.

FEBRUARY was a quiet, uneventful and rather disappointing month for the London wood trade. The Dock deliveries were better than they were in January, but are still about 1,500 standards less than the very moderate figures for February, 1904, and when compared with those, say, for 1902 they show a reduction in the first two months of the year of about 5,000 standards per month. The overside deliveries were a little better, but at this time of year they are quite an unreliable test of consumption, so that the very general expectation of an improvement in our trade is not at present evident, but remains to be justified in the future. There was practically no change in prices in London during the month. Messrs. Churchill & Sim state that the general business in wood for importation from abroad during the coming season has been much less active than in January. Swedish shippers in particular have refused no reasonable offers for deal sizes, and a small Cape demand which shows now some signs of expanding has been met very cheaply. For battens and scantlings, quotations have been fully maintained and now look fairly assured for the season. Large sales of prepared boards continue to be effected at rates which have little to be desired from a buyer's point of view. Whitewood remains firm in sympathy with spruce, for which quotations have been freely advanced in consequence of an unusually hard winter in Canada. Business in pine deals is much restricted by a high cost and lack of demand. Freight rates remain very low from every quarter.

Messrs. Denny, Mott & Dickson, Ltd., state that February produced the natural reaction in feeling with those who, having bought, found no very marked increase in the demand for consumption. On the whole, however, there was a steady undertone of improved confidence generally, and although the increase in the savings of the country finds expression in increased investments in Stock Exchange securities—as it is already doing—the stimulus to general trade is bound to follow, and the demand for wood for renewed house, factory, ship and other constructive work should soundly, if slowly, develop as the year proceeds—given always that no abnormal political event checks the reviving confidence of investors.

The abstract of stock, consumption, &c., for February, published by Messrs. Foy, Morgan & Co., is given in the table at the foot of this page.

Dock Stocks in February.

The stock of wood in the public docks of London on February 28th was as follows :—

	Pieces.
Foreign deals and ends	1,655,000
Do. battens	2,533,000
Pine deals and battens	1,211,000
Spruce do. do.	1,022,000
Boards, rough	3,691,000
Do. prepared	7,157,000

Totalling 17,269,000 pieces, as compared with 20,449,000 in 1904, 17,476,000 in 1903 and 18,967,000 in 1902.

In other kinds the stock was as follows :—

Foreign wainscot logs	257 pieces.
Do oak timber	890 loads.
Do. fir timber	1,053 do.
Colonial oak timber	1,492 loads.
Do. birch timber and planks	2,367 do.
Do. elm and ash timber	810 do.
Do. yellow pine	455 do.
Do. red pine	243 do.
United States pitch-pine timber	20,610 do.
Do. do. deals	54,000 pieces.
East India teak	8,287 loads.

The deliveries for January and February were as follows :—

	Pieces.
Foreign deals and ends	564,000
Do battens	987,000
Pine deals and battens	164,000
Spruce do. do.	241,000
Boards, rough	1,100,000
Do. prepared	2,366,000

Totalling 5,422,000 pieces, as compared with 5,835,000 in 1904, 6,923,000 in 1903 and 7,056,000 in 1902.

The deliveries for February were as follows :—

	Pieces.
Foreign deals and ends	278,000
Do. battens	537,000
Pine deals and battens	79,000
Spruce do do	136,000
Boards, rough	538,000
Do. prepared	1,281,000

Totalling 2,849,000 pieces, as compared with 3,059,000 in 1904, 3,605,000 in 1903 and 3,751,000 in 1902.

Deliveries to Craft.

The deliveries direct from ship to craft for January and February were : —

	1905. P.s.h.	1904. P.s.h.	1903. P.s.h.	1902. P.s.h.
Deals and battens	3,431	3,957	2,591	3,761
Boards	1,292	916	1,438	12,003

and for February :—

Deals and battens	1,797	1,325	661	1,388
Boards	898	514	759	1,423

Soft Woods.

Russian Deals and Battens.—There was no change in the prices for Russian deals or battens. They have varied considerably in accordance with quality and condition, but the basis price remains unaltered. A large number of small sales continues to be made for arrival, for each of which the selling agents have to work very hard.

Swedish Deals.—Messrs. Churchill & Sim state that there is no change to report in the prices for Swedish deals or battens in London during February. The demand was poor, but the stock was very moderate. Prepared boards fell very steadily in price throughout the month, though there was nothing in the position of the London market to account for this. Probably the low cost of boards for shipment from abroad during the season is being rather more than discounted.

Norwegian Boards.—There was a steady fall in the prices for Norwegian prepared boards in London throughout February. Here again figures of the stock or consumption do not furnish a reason, and the fall was so unexpected that the ordinary flow of the supply has not yet been checked ; but clearly it must affect the usual shipments to this market in the spring and summer.

Finnish Battens.—Prices in London remain steady at previous rates ; while for the coming season the probability seems to be that the demand will continue to be fully equal to the easy absorption of the quantities offering for shipment on a very reasonable basis.

Canadian Deals and Spruce.—The demand for pine deals was very small, and prices dragged along just under the January rates. For spruce there has been no change so far, prices having been kept steady by competition with Riga and Galatz whitewood. There has, however, been some excitement among the lower port shippers, in consequence of the abnormal severity of the winter in New Brunswick and Nova Scotia, which has not only hindered the transportation to the shipping ports of the supplies of spruce, birch, &c., cut for early shipment, but has also prevented the work in the forests on the production for shipment later in the season, so that contracts already made cannot be carried out, and shippers are nervous about contracting again ahead. There is no change to report in the prices of oak or yellow pine timber in London, while for birch, elm and ash prices have been a point or two down in February. For birch, at any rate, there is likely to be a prompt and sharp reaction. There was a fair delivery of sawn timber from the docks, and the stock is again reduced, while orders ahead are coming in with rather hopeful persistence. There was practically no change in prices during the month beyond those due to variation in the respective quality of the parcels sold. For deals the demand has been very small and prices have dropped again, remaining at a very unsatisfactory level. These shipments consist almost exclusively of the larger sizes.

Hardwoods.

Teak.—Messrs. Denny, Mott & Dickson report that the landings in the London docks during February consisted of 976 loads of logs and 423 loads of planks and scantlings, or a total of 1,399 loads, as against 591 loads in February, 1904. The deliveries into consumption were 419 loads of logs and 360 loads of planks and scantlings—together 782 loads, as against 788 loads for February, 1904. The increase in the import of logs has been due to the arrival of a small sailing cargo from Bangkok, which feature, however, is not likely to be repeated for a long time to come, owing to the small stocks at the shipping ports not permitting the shippers to commit themselves to the charter of even very small sailing ships. The market has, therefore, only to look to hand-to-mouth parcels by steamers for this year's supplies ; and such chance shipments are mostly sold to the consumer whilst on the way, so that the present meagre dock stocks will tend to still further decrease.

Mahogany.—Messrs. Denny, Mott & Dickson state that this market exhibited little feature during February. The imports were quite sufficient for the moderate demand ; and perhaps prices are slightly weaker, without, however, any appreciable decrease in the confidence of holders in the general soundness of the position. Messrs. Leary report that during the last fortnight of February imports were on a more liberal scale, and the stocks were thereby sufficiently replenished. Only one auction took place, the results being good for all except the most inferior wood.

Odessa Oak.—There have been important enquiries on the market for this wood, and the demand promises to exceed the estimate of next season's supplies. The very marked growth in the appreciation of consumers for Odessa oak is greatly due to the special care taken in the shipments by the chief shippers.

American Whitewood.—Lumber.—A fair market, with first and medium qualities in chief request ; culls have been rather over supplied ; values range from 2s. 3d. to 3s. 6d. per cubic foot for first quality ; 1s. 9d. to 2s. for clear saps, 1s. 6d. to 1s. 9d. for medium, 1s. to 1s. 3d. for culls.

ABSTRACT OF STOCK, CONSUMPTION, &C., FOR FEBRUARY.

S.C. Dks. and M. Dks.	Deals (Fir).	Battens (Fir).	Pine.	Spruce.	Pitch-pine Deals.	Deals and Battens in Aggregate.	Rough Boards (All Countries).	Flooring.	Floated Timber.
	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Loads.
Public dock stock	1,351,984	2,783,185	1,211,528	1,022,007	54,011	6,422,715	3,690,569	7,157,356	27,500
Monthly public dock consumption	238,832	552,922	79,356	132,743	6,933	1,010,786	539,303	1,260,652	3,863
Overside stock	358,248	829,383	119,034	199,114	—	1,505,779	808,954	428,622	—
Overside consumption (estimated of dock) :— 77 per cent. Sawn, 50 ,, Planed	183,901	425,750	61,104	102,212	—	772,967	415,263	630,326	—
Duration of supply at same rate of consumption	4·05 months.	3·69 months.	9·47 months.	5·20 months.	7·79 months.	4·44 months.	4·71 months.	4·01 months.	7·12 months.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Graving Dock.

BRADFORD.—HYDRAULICS writes: "Draw cross-sections of entrance and centre of a graving dock 60ft. entrance, the substratum being water-bearing sand and gravel."

We have referred before to the abuse of these "Enquiries Answered." This is another instance of it.

S.K. Examinations in Building Construction.

DORCHESTER.—H. M. T. writes: "Where can the examination questions in architecture (and, if possible, answers) of the South Kensington Board of Education of current years be obtained?"

Questions and answers have been published in our columns. See the replies on p. 226 of the issue for October 26th, 1904, and on p. 116 of the issue for March 9th, 1904.

Safe Load on Projecting Pin.

BRADFORD.—HYDRAULICS writes: "A steel pin 3ins. diameter overhangs 3ins. It is firmly fixed at other end. What load applied uniformly, such as the tension of a well-fitting eye-bar 3ins. thick, will the pin bear so as to give extreme fibre stress of 6½ tons per square inch?"

Let P = load in lbs., d = diameter of pin in inches, l = length of pin in inches, f_t = maximum safe tensile stress in tons per sq. in., say 6·5, f_s = maximum safe shear stress in tons per sq. in., say 5. The simplest case would be when the pin was in single shear.

$P = \frac{\pi}{4} d^2 f_s = \cdot 7854 \times 3^2 \times 5 = 35\cdot 35$ tons safe load; but there would be few cases in practice where pure shear stress would occur, although this method of calculation is often adopted. Taking the pin as a cylindrical cantilever, the ordinary calculation would be:—Bending moment = moment of resistance, $\frac{Pl}{2} = \frac{\pi}{32} d^3 f_t$, from which $P = \frac{0\cdot 196 d^3 f_t}{l} = \frac{0\cdot 196 \times 3^3 \times 6\cdot 5}{3} = 11\cdot 5$ tons safe load. But, although this is the method given by Professor Unwin in his "Machine Construction" for finding the safe load on crank pins, it appears that an allowance for shear is also requisite. This would make the working as follows, taking the same working stress in tension and shear:—

$$\frac{P}{\frac{\pi}{4} d^2} + \frac{P \frac{1}{2} l}{\frac{\pi}{32} d^3} = 6\cdot 5, \text{ or } \frac{P}{7\cdot 07} + \frac{P}{1\cdot 764} = 6\cdot 5,$$

whence $P = \frac{6\cdot 5 \times 7\cdot 07 \times 1\cdot 764}{1\cdot 764 + 7\cdot 07} = 9\cdot 17$ tons, or, say, 9 tons safe working load uniformly distributed.

HENRY ADAMS.

Professional Etiquette and Advertising.

W. T. writes: "I am about to open an office in a neighbouring town. Is it considered a breach of professional etiquette to advertise in a local paper to that effect, or would it be more correct to send round a circular to people of position notifying them of my intentions?"

You do not say what you are, but we presume you are an architect. There is no reason why you should not notify through the local paper that you have opened an office in the town, and also, if you wish, circularize possible clients, as suggested; but everything of course depends on the particular way in which you do this. No doubt a lot of rubbish about the dignity of the profession is talked at society meetings, while the very men who are then so zealous act in quite unprofessional manner in practice; nevertheless there is such a thing as etiquette, which every self-respecting architect will observe, and nothing in the nature of touting is admissible. Still, architects have to live and to move with the times, and if no work comes to them while they are sitting in their back offices with the utmost professional dignity they need to adopt some method of drawing attention to their existence. Exactly how this should be done rests for each person to decide for himself, in view of the particular circumstances in which he is placed.

Drain or Sewer.

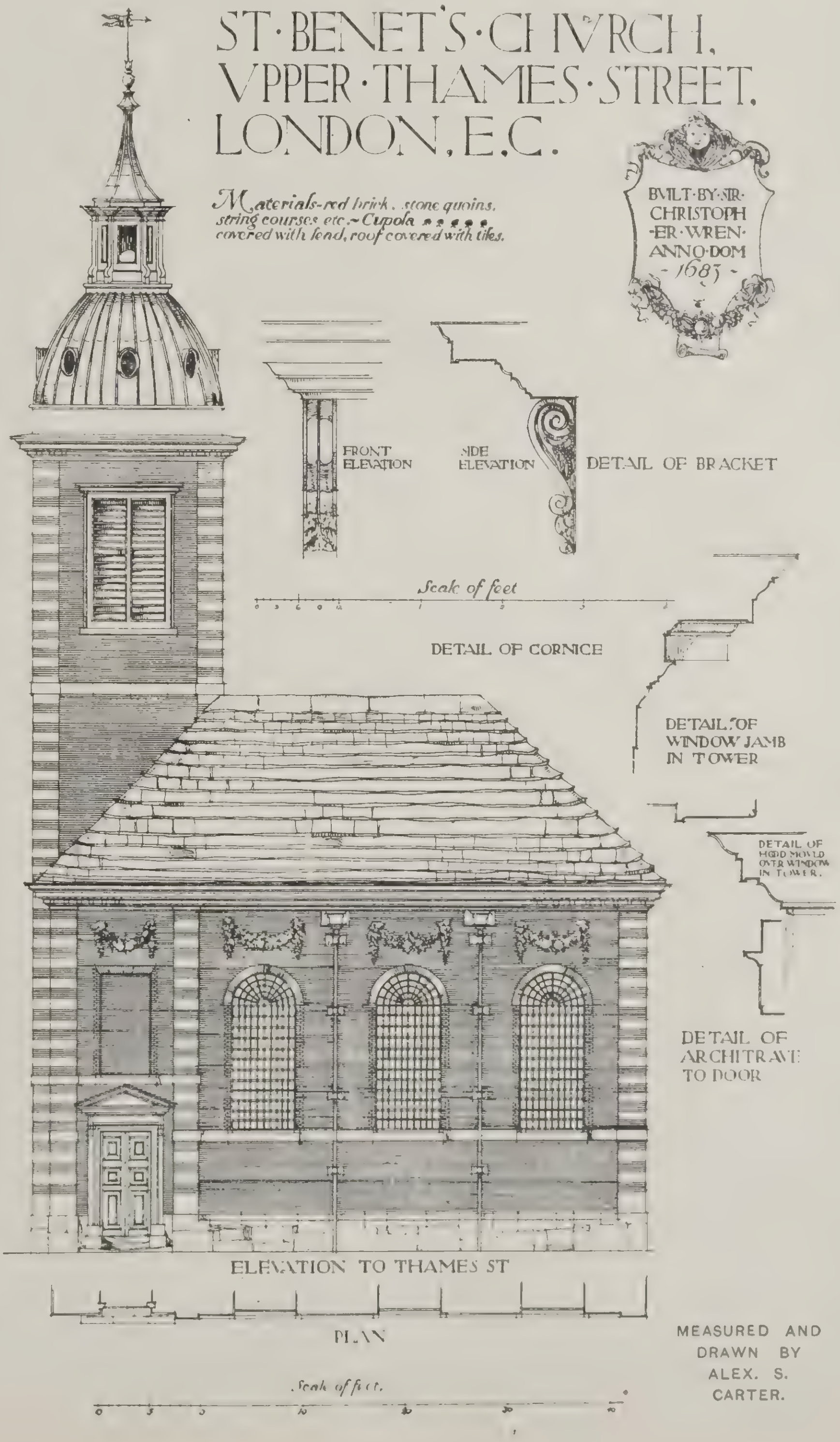
LEYTON.—MATERIAL DIFFERENCE writes: "Referring to the answer to my query on p. 87 of your issue for February 15th, the 'town hall plan' referred to means the plan approved by the town hall authorities (*i.e.*, the then vestry) when the houses were being built and in accordance with which the drains were ordered to be laid. This house is one of several which discharge sewage into a common drain, the said common drain going under the house referred to."

The point was decided in the case of *Greater London Property Co.* v. *Foot* (1899, 1 Q.B. 972), in which it was held that a mere deviation in the course of a drain from the plan signed by the surveyor (there being no evidence that any houses other than those on the plan were drained by the combined operation) was not sufficient to convert it into a sewer.

Designs of Houses.

PADSTOW.—W. J. W. writes: "Is there a book published giving designs for different classes of houses?"

Innumerable designs for houses have been published in this Journal and in our contemporaries, which you can consult at any


ST·BENET'S·CHVRCH,
VPPER·THAMES·STREET,
LONDON, E.C.
Materials-red brick, stone quoins, string courses etc.~Cupola covered with lead, roof covered with tiles.
BVILT·BY·SIR·CHRISTOPH-ER·WREN·ANNO·DOM -1683-
FRONT ELEVATION
SIDE ELEVATION
DETAIL OF BRACKET
Scale of feet
DETAIL OF CORNICE
DETAIL OF WINDOW JAMB IN TOWER
DETAIL OF HOOD MOULD OVER WINDOW IN TOWER.
DETAIL OF ARCHITRAVE TO DOOR
ELEVATION TO THAMES ST
PLAN
Scale of feet

MEASURED AND DRAWN BY ALEX. S. CARTER.

good-sized public library—say Launceston in your case. Numerous books of such designs have also been published, as you will see by consulting our Book List (given in previous issues).

The Orders.

ROCHESTER.—H. V. writes: "Please recommend some books which give general rules for setting out the Greek and Roman Orders."

We recommend Spiers's "Orders of Architecture" (price 10s. 6d. post free from our offices).

Formulae for Wooden Posts.

ROCHESTER.—H. V. writes: "Are the following formulæ for determining the sizes of wood storey posts reliable, and what is the meaning of the various letters?—

Square posts, $5 = \frac{ad^4}{L^2}$.

Circular posts, $5 = \frac{ad^4}{1{\cdot}7L^2}$.

Rectangular posts, $5 = \frac{abt^3}{L^2}$."

These appear to be similar to Reuleaux's formulæ. They may be tested and the coefficient added by taking examples and working them by other methods, say square post 6ins. by 6ins., rectangular post 4ins. by 9ins., and a circular post 6¾ins. diameter, all 10ft. long and of the same sectional area, ends flat. By Table VII., "Notes on Building Construction," based upon experiments:—Square, $\frac{10 \times 12}{6} = 20$ diameters long; area, $6 \times 6 = 36$ sq. ins.; allowance, 115 tons per sq. ft.; breaking load $= \frac{36}{144} \times 115 = 28{\cdot}75$ tons. Rectangular, $\frac{10 \times 12}{4} = 30$ diameters long; area, $4 \times 9 = 36$ sq. ins.; allowance, 90 tons per sq. ft.; breaking load $= \frac{36}{144} \times 90 = 22{\cdot}5$ tons. Circular, $\frac{10 \times 12}{6{\cdot}75} = 17{\cdot}7$ diameters long; area, 36 sq. ins.; allowance (by interpolation), 116 tons per sq. ft.; breaking load $= \frac{36}{144} \times 116 = 29$ tons per sq. ft. Reuleaux's formula for approximate safe permanent load in tons on square fir posts is $50\frac{d^4}{l^2} = 50 \times \frac{6^4}{120^2} = 50 \times \frac{1296}{14400} = 4{\cdot}5$ tons, showing a factor of safety of $\frac{28{\cdot}75}{4{\cdot}5} = 6{\cdot}4$ on the previous calculation, practically identifying the given formula and fixing the coefficient. Applying this knowledge to the rectangular post, we have $\frac{50bt^3}{l^2} = \frac{50 \times 9 \times 4^3}{120^2} = 2$ tons, showing a factor of safety of $\frac{22{\cdot}5}{2} = 11{\cdot}25$. Applied to the circular post, $\frac{50d^4}{1{\cdot}7l^2} = \frac{50 \times 6{\cdot}75^4}{1{\cdot}7 \times 120^2} = 4{\cdot}24$ tons, showing a factor of safety of $\frac{29}{4{\cdot}24} = 6{\cdot}8$. It should be noted that a small *l* should be placed in the formulæ submitted, as the length must be taken in inches; the formulæ may then be pronounced satisfactory. HENRY ADAMS.

Ancient Lights.

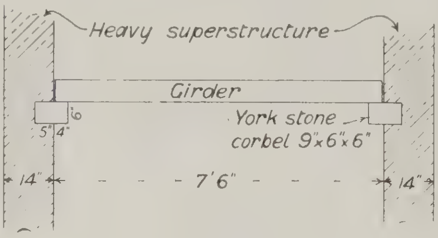
X. writes: "A window on a first floor overlooks an old roof. It is proposed to demolish the old building and reconstruct. The new building is to be finished with a lead flat about 12ins. above the existing ancient light. What are the limits to observe in setting back the flat so as not to interfere with the ancient light? Is it necessary to set back all around the window, or only directly in front?"

It will be necessary to set back to the angle of the existing old roof on one side and to an angle of 45 degs. on the other, otherwise there would be an undoubted obstruction of light. M.

Strength of Stone Corbel.

REIGATE.—C. E. S. writes: "How can I determine the safe carrying load of the corbels shown by the accompanying sketch?—the girder to rest on corbels, and not to be built into wall either end."

Taking the ultimate tensile strength of good York stone as 1,000 lbs. per sq. in, the girder as possibly bearing on outer end of corbel only, the factor of safety 5, then the safe carrying load of each corbel, so far as regards its own strength, will be:—Bending moment = moment of resistance, $wl = zc$, $wl = \frac{bd^2}{6} \times \frac{1000}{5}$, $\therefore w = \frac{bd^2}{l} \times 33\frac{1}{3} = \frac{6 \times 6^2}{4} \times 33\frac{1}{3} = 1{,}800$ lbs. But with 1,800 lbs. at outer end of corbel, the inner end will have a lifting tendency of $\frac{1800 \times 4}{5} = 1{,}440$ lbs. and the face of wall will have to support a load of $1800 + 1440 = 3240$ lbs., or $\frac{3240}{6} = 540$ lbs. per inch run on a line. Taking now the load bearing on the centre of the projection, half the length in wall resisting downward force, and half resisting upward force, we have $\frac{1800 \times 2}{3{\cdot}75} = 960$ lbs. lifting tendency at back, and $1{,}800 + 960 = 2{,}760$ lbs. downward thrust upon a surface of $6 \times 2{\cdot}5 = 15$ sq. ins., $\frac{2760 \times 144}{15 \times 2240} = 11{\cdot}83$ tons per sq. ft.; while the maximum safe load on stock brickwork in mortar is 4 tons per ft. super. The actual stresses will depend upon the exact conditions of the workmanship and material, but it is evident that it will be necessary to increase both the width of corbel and the distance built into wall.



HENRY ADAMS.

Colour-wash on Cement Facing.

KENSINGTON.—W. H. writes: "What is the cause of a cement colour-wash on the external cement face of a house going to powder and coming off? I colour-washed the outside walls of the house in 1900, and again in 1903, and each time the wash has gone to powder and can with the greatest ease be brushed off with the finger."

The colour has perished the cement, and probably an additional cause was the wall not being wetted before application. The work should be cement-washed first, and a colour wash of distemper or water paint put thereon.

Housing.

COVENTRY.—JUNIOR writes: "Can you inform me if any paper has been read on the housing of the working classes, and if so, where can I get a copy?"

A number of papers on the subject have been published in our columns and can be found by consulting back volumes. We may specially mention the papers by Messrs. Louis Ambler and Owen Fleming read before the Architectural Association, and reported in our issue for May 14th, 1902; particulars, with plans and illustrations, of "Some Housing experiments in Glasgow," published in our issue for October 9th, 1901; and a review of the L.C.C. book on "London Housing, 1855-1900," with several plans, in our issue for February 13th, 1901. Cranfield's "Housing of the Working Classes" is a good recent book on the subject.

Books on Brickmaking.

PORTSMOUTH.—X. writes: "Please give names and prices of books dealing with brick manufacture, kilns, &c."

See our No. 1 Book List.

A Fire-resisting Tool Chest.

CRICK.—W. H. C. writes: "Would it be possible to make a joiner's tool chest fireproof by nailing 'Uralite' on the outside? Of course there would be a joint where the lid is hinged."

Yes—the idea is a good one. We suggest nailing sheets of "Uralite" $\frac{3}{16}$in. thick in the positions you propose.

Clerk of Works.

BIRMINGHAM.—STUDENT writes: "I have had seven years' experience in the architectural profession. I am very well up in all branches and have gained several successes in examinations, competitions, &c. Would it be possible, and advangeous, for me to take up the duties of clerk of works for a period of perhaps twelve months? What subjects would I need to study and what are the general duties of clerks of works?"

Yes, it would be sure to do you much good. You should read books on the duties of clerks of works, the conduct of building works, the subject of specifications, and it would be well if you passed the examination for clerks of works held by the Carpenters' Company, whose address is Carpenters' Hall, London Wall, E.C. A book on the duties of clerks of works was written by the late Mr. Leaning. Papers have also been read on the subject before various societies, as you will find by referring to our volumes.

Cottage Baths.

LONDON.—M. A. writes: "Which is the simplest method of providing a bath in a six-roomed labourer's cottage? Is tinned iron the most suitable cheap material? Is a bath less than 5ft. long worth providing? Does not sinking it below the floor mean expense in excavation and great difficulty in emptying and repairing? Are upright cabinets satisfactory? Should the bath be in the scullery in preference to the living-room?"

A painted cast-iron bath is the cheapest, and quite satisfactory. It is not advisable to place it beneath the floor, and it should not be in a living-room. Upright bath cabinets are expensive, and for that reason must be eliminated, though they are convenient. It is sometimes possible to put the bath in such a position that a door can be folded back to enclose it and shield it from view, but perhaps the handiest and most economical position is to place it under the sink and draining-board on hinges to pull out. A 5ft. bath is sufficient.

Miss Ethel Charles, A.R.I.B.A., who won the Institute Essay Medal this year, served her articles for three years with Messrs. Ernest George & Peto, afterwards working for some months in the office of Mr. Walter Cave. She passed the R.I.B.A. intermediate and final examinations, and in 1898 was duly elected an Associate, being the first woman to attain this distinction. Her proficiency in modern languages, combined with her professional knowledge, has made her in request as a reviewer of modern Italian and German books on architecture.

Coming Events.

Wednesday, March 8.

ROYAL SANITARY INSTITUTE — Inspection and Demonstration at Islington, by Mr. James R. Leggatt, at 2 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. Hippolyte J. Blanc, R.S.A., on "The Arts of the Monastery," at 8 p.m.

Thursday, March 9.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY. —Mr. E. C. Skill on "Architectural Photography," at 6.30 p.m.

CARPENTERS' COMPANY.—Dr. J. Willis Clark on "The Origin and Development of the Collegiate Plan at Oxford and Cambridge," at 8 p.m.

ARCHITECTS' BENEVOLENT SOCIETY. — Annual General Meeting, R.I.B.A., 9, Conduit Street, W., at 5 p.m.

MANCHESTER SOCIETY OF ARCHITECTS.—Exhibition and Discussion of Students' Drawings, at 6.45 p.m.

Friday, March 10.

ARCHITECTURAL ASSOCIATION.—Mr. H. V. Lanchester, A.R.I.B.A., on "Law Courts," at 7.30 p.m.

INSTITUTION OF CIVIL ENGINEERS (Students' Meeting).—Mr. F. G. Helsby on "The Purification of Sewage," and Mr. F. O. Kirby on "The Purification of Sewage by Hydrolysis and Oxidation," at 8 p.m.

GLASGOW TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Mr. J. S. Boyd on "The Construction of a Stone Dome for a Public Building," at 8 p.m.

UNIVERSITY COLLEGE.—Mr. D. S. MacColl on "Madox Brown and the Pre-Raphaelites," at 4.30 p.m.

Saturday, March 11.

ROYAL SANITARY INSTITUTE. — Inspection and Demonstration at Tottenham disinfecting station and dust destructor, by Mr. J. F. Butler-Hogan, at 3 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visits to Midlothian county council buildings and new "Scotsman" office buildings.

JUNIOR INSTITUTION OF ENGINEERS.—Visit to the Ritz Hotel, Piccadilly, at 3 p.m.

ARCHITECTURAL ASSOCIATION. — Fourth Spring Visit to University College Hospital extension, at 2.30 p.m.

Monday, March 13.

BRISTOL SOCIETY OF ARCHITECTS. — Mr. D. M. Nesbit, M.I.M.E., on "Heating and Ventilation," at 8 p.m.

SURVEYORS' INSTITUTION. — Mr. E. Morton on "Surveyors' Reports and Certificates," at 8 p.m.

Tuesday, March 14.

CARDIFF, SOUTH WALES AND MONMOUTHSHIRE ARCHITECTS' SOCIETY.—Mr. Herbert W. Wills, A.R.I.B.A., on "The Architectural Planning of Public Buildings," at 8 p.m.

ARCHITECTURAL ASSOCIATION OF IRELAND.—Mr. W. S. Hayes on "Some House of Lords' Decisions on Building Contracts," at 8 p.m.

Wednesday, March 15.

ROYAL SANITARY INSTITUTE. — Inspection and Demonstration at L.C.C. Municipal Lodging-House, Carrington House, Deptford, S.E., at 3 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. W. Beattie Brown, jr., on "Spain," at 8 p.m.

ARCHITECTURAL ASSOCIATION (Discussion Section). —Mr. Alan E. Munby on "An Information Bureau on the Products of the Building Trade Industries," at 7.30 p.m.

SOCIETY OF ARTS.—Mr. E. H. Hankin on "Methods of Design in Mahomedan Art," at 8 p.m.

Current Market Prices.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	8	0	1	10	0
Clover, best	per load	3	15	0	4	2	6
Hay, good	do.	3	10	0	3	15	0
Sainfoin mixture ...	do.	3	10	0	3	17	6
Straw	do.	1	12	0	2	0	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ...	per cwt.	1	0	5	—		
Colza Oil, English ...	do.	1	3	0	—		
Copperas	per ton	2	0	0	—		
Lard Oil	per cwt.	2	15	0	2	17	
Lead, white, ground, carbonate	per ton	16	0	0	—		
Do. red	do.	15	0	0	—		
Linseed Oil, barrels ...	per cwt.	0	16	9	—		
Petroleum, American ...	per gal.	0	0	5⅛	0	0	5¼
Do. Russian ...	do.	0	0	4¾	—		
Pitch	per barrel	0	8	0	—		
Shellac, orange	per cwt.	7	10	0	—		
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	4	6	—		
Tar, Stockholm	per barrel	1	5	0	—		
Turpentine	per cwt.	1	18	3	—		

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ...	per ton	80	0	0	—		
Iron, Staffs., bar ...	do.	5	17	6	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	2	6	10	5	0
Lead, pig, Soft Foreign...	do.	11	18	9	—		
Do. do. English common brands	do.	12	0	0	—		
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14	0	0	—		
Do. pipe	do.	15	0	0	—		
Nails, cut clasp, 3in. to 6in.	do.	9	5	0	—		
Do. floor brads... ...	do.	9	0	0	—		
Steel, Staffs., Girders and Angles	per ton	5	5	0	6	0	0
Do. do. Mild bars ...	do.	6	0	0	6	5	0
Tin, Foreign	do	130	10	0	131	0	0
Do. English ingots ...	do.	130	10	0	133	0	0
Zinc, sheets, Silesian ...	do.	28	0	0	—		
Do. do. Vielle Montaigne	do.	29	0	0	—		
Do. Spelter	do.	23	15	0	24	2	6

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Whitewood, American, logs.	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	3	0
Fir, Dantzic and Memel	per load	2	7	6	4	15	0
Pine, Quebec, Yellow ...	do.	4	5	0	7	5	0
Do. Pitch, American...	do.	2	8	0	5	15	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, St. Petersburg, White, 1st, 3×11	per std.	10	10	0	11	5	0
Do. do. do. do. 3×9	do.	10	10	0	—		
Do. do. do. 3rd, 2½×7	do.	8	5	0	—		
Do. do. Yellow, 1st, 2½×7	do.	12	0	0	—		
Do. do. do. 2nd, 3×9	do.	9	10	0	—		
Do. do. do. Unsorted, 3×9	do.	10	10	0	—		
Do., Mesane, White, 2nd, 3×11	do.	9	15	0	—		
Do. Archangel, White, 1st, 3×9	do.	9	15	0	—		
Do. do. Yellow, 3rd, 3×11	do.	9	10	0	—		
Do. Kovda, Yellow, 3rd, 3×9	do.	11	10	0	—		
Do. Mesane, Yellow, 2nd, 3×9	do.	15	0	0	—		
Do. do. do. 3rd, 3×9	do.	11	5	0	—		
Do. do. do. 4th, 3×9	do.	9	5	0	—		
Do. Stugsund, Yellow, 5th, 3×9	do.	8	10	0	—		
Do. Gefle, Yellow, 3rd, 3×9	do.	12	15	0	—		
Do. do. do. 4th, 2½×7	do.	9	5	0	—		
Do. Uleaborg, Yellow, Unsorted, 3×8	do.	8	5	0	—		
Do. Quebec, Spruce, 2nd, 3×9	do.	9	10	0	—		
Do. do. do. 3rd, 3×9	do.	9	0	0	—		
Do. do. do. do. 3×7	do.	7	10	0	—		
Do. Quebec and Saguenay, Spruce, 4th, 3×8	do.	7	5	0	—		
Do. do. do. do. do. 3×7	do.	7	0	0	—		
Do. do. do. do. Unsorted, 3×9	do.	8	5	0	—		
Battens, all kinds ...	do.	6	5	0	13	10	0
Flooring Boards 1in. prepared, 1st... ...	per square	0	9	0	0	10	9
Do. 2nd	do.	0	8	9	0	10	0
Do. 3rd, &c.	do.	0	7	9	0	9	6

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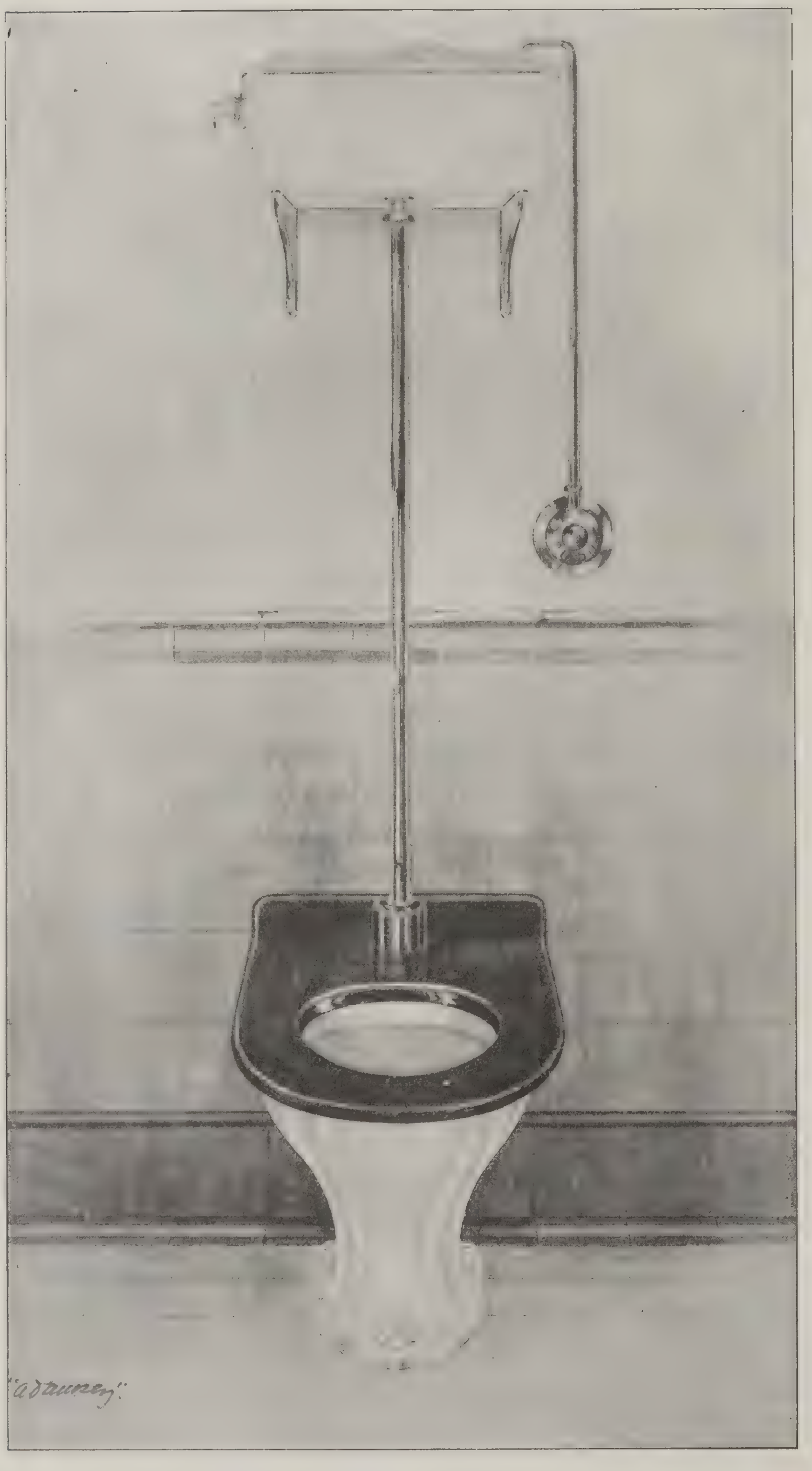

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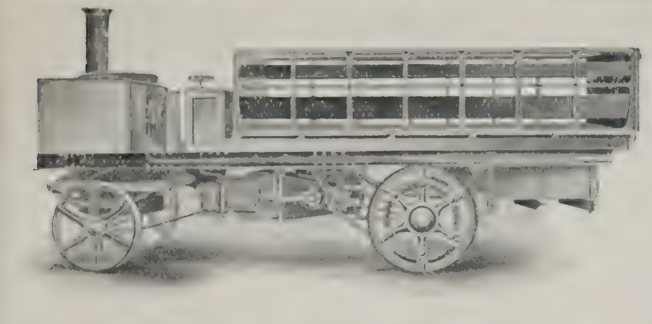

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Trade and Craft.

Heavy Motor Traction.

Motor traction is making steady progress in the building and engineering trades. The motor wagon and motor lorry offer many advantages, particularly in respect of taking heavy loads and in economy of working. Among the applications to which a motor wagon can be put in these industries we may mention the transport of building stone and road materials, bricks, iron and steel work, timber, excavated material, &c. Though the motor trade is prospering, it is as nothing to the boom that will be witnessed within the next few years in the replacement of the multitude of horse carts and vans. Wisely recognising this, the St. Pancras Ironwork Co., Ltd., have recently taken up this branch of engineering in addition to their work in iron fireproof staircases, stable fittings, pavement lights, &c., for which they have a very wide reputation. It may be objected by contractors that in the cartage of excavated material motor wagons would not be able to ascend steep runways, or would sink in the soft ground, but with wide wheels both these difficulties are overcome, and motor wagons have been proved to be even superior to horses for the work. In this connection, by the way, the St. Pancras steam wagon possesses the advantage of exposing no parts of the mechanism to serious damage in the event of its sinking into bad ground, in which particular some of the other well-known types are deficient. The St. Pancras motor wagon is of standardized design and takes full advantage of the Local Government Board regulations. It is steam driven, petrol being advantageous for light cars only. Designed to carry 5 to 6 tons, it will carry and trail a total load of from 8 to 9 tons, according to the gradients to be encountered. This may be taken as the maximum possible load which may be efficiently handled without transgressing the regulations. In this type of motor wagon the machinery is simple and all complication is avoided; the design, materials and workmanship are such that the above loads can be dealt with day in and day out without incurring excessive depreciation and expensive repairs. From experience of the wagon in operation we can testify to its strength and efficiency and can highly commend its design. Every little detail has been thoroughly thought out. The older types of steam wagons suffered from a want of sufficient boiler power, due chiefly to the anxiety of the designers to reduce weight, the boiler usually being too small for the work required of it, with the result that there was a large bill for repairs and a want of sufficient power. In the St. Pancras wagon, the boiler, while not excessive in weight, has a large reserve of power, so that it is easy to maintain a good head of steam, even with inferior fuel. The engine, which is capable of developing 40 h.p., is compound and has cylinders respectively 4ins. by 7ins. bore and 6ins. stroke. The whole of the engine and gearing runs in a dust-proof and oil-tight casing, all the bearings being lubricated on the splash system. This is a great feature of the wagon, and by the unlocking of four bolts, the whole of the engine can be dropped on the ground for repairs, while by means of doors in the floor of the wagon it can be inspected without removing the engine. The wagon is chain-driven, the arrangement giving great flexibility to the drive, at the same time maintaining perfect alignment of the engine and gear shafts. The use of such chains for the drive causes fewer parts to be exposed to dust and dirt and subject to inefficient lubrication, and is superior to gear transmission. If a flying stone got in the cogs and broke them, an ordinary wagon would be put out of action, whereas if one chain broke, a wagon could be driven home with the other. The advantage of a chain gear is also very marked when a special type of wagon is needed, such as one with a very low float body for taking heavy stones, ironwork, safes, &c. This the company are able to do by cranking the back axle, which is of course impossible if it is a live one. A few people, however, prefer a complete gear transmission, and the St. Pancras Co. have so arranged their system that they are able to fit gears instead of chains and sprockets with the least possible deviation from their standard design. Two speeds are provided—six and three miles per hour. The steering gear is on the Ackermann system. The arrangement of operating handles and levers has been studied in order to give the driver complete control of the vehicle without moving from the steering wheel. With regard to the frame, here a very great improvement on ordinary types has been effected, and the St. Pancras arrangement has been patented by the company. The fore-carriage is transversely pivoted, thus obviating the distortion and loosening of the rivets when traversing uneven ground which occurs in other types of frames where the straining is great, as can easily be understood when one considers the heavy weight carried. The frame is of strong channel section steel, suitably braced and tied. Any type of carrying body can be fitted to order to the standard chassis. From the average of several examples taken from actual practice, the cost of operating the St. Pancras wagon under average conditions of loading works out at $1\frac{1}{2}$d. per ton mile. Both in the matter of first cost and expense of working this wagon triumphantly challenges comparison with older wagons, while it is stronger in construction and more powerful. We shall deal with its construction more fully on another occasion. The address of the company is 171, St. Pancras Road, London, N.W.

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
March 9	Newhall, Burton-on-Trent—Extension to Sunday School	Trustees of Wesleyan Chapel	C. H. Read, Granville Mill, Swadlincote.
,, 9	Greenwich—Alterations, &c., to Relief Offices	Guardians	L. Jacob, 493 New Cross Road, S.E.
,, 9	Lindley, Huddersfield—House	—	J. Kirk & Sons, Architects, Huddersfield.
,, 9	Swansea—Tramp Cells	Guardians	Union Offices, Alexandra Road, Swansea.
,, 10	Etwall, Derby—Alterations, &c., to Council Schools	Managers	A. Eaton, 6 St. James's Street, Derby.
,, 10	Glyn-Neath, Wales—Fan- and Engine-house	—	J. Roberts, Fisher Street, Swansea.
,, 10	Birstall, Yorks—Hospital	Oakwell Joint Hospital Board	William Middlebrook, 70 Huddersfield Road, Birstall.
,, 10	Ullapool, N.B.—Naval Reserve Buildings	—	Coastguard Station, Ullapool.
,, 10	Oakwell—Smallpox Hospital	Joint Hospital Board	William Middlebrook, 70 Huddersfield Road, Birstall, near Leeds.
,, 10	Banff—Naval Reserve Buildings	—	Superintending Engineer, H.M. Naval Establishment, Rosyth.
,, 11	Dublin—Church	Very Rev. V. Byrne, S.J.	Slevin & Son, 16 Dame Street, Dublin.
,, 11	Broadstairs—Alteration, &c., to Engine-house	Urban District Council	P. Griffiths, 54 Parliament Street, S.W.
,, 11	Barnoldswick—Additions to Station Buildings	Directors of Midland Rly. Co.	Company's Architect, Cavendish House, Derby.
,, 11	Mylor, Cornwall—Farmhouse	—	Estate Office, Carclew, Perranarworthal.
,, 11	Rye, Sussex—Ward at Infirmary	Guardians	E. J. Cory, High Street, Rye.
,, 11	Barrow-in-Furness—Museum Case	Corporation	Borough Engineer's Office, Barrow-in-Furness.
,, 11	Edinburgh—School	School Board	Mr. Carfrae, 3 Queen Street, Edinburgh.
,, 11	Manchester—Laboratory	Rivers Committee	Rivers Department, Town Hall, Manchester.
,, 11	Perth—Hospital	Town Council	G. P. R. Young, 42 Tay Street, Perth.
,, 11	Exmouth—Four Houses	—	Crews & Son, Rolle Street, Exmouth.
,, 13	Enfield and Willesden—Caretaker's Quarters	Finance Committee	H. T. Wakelam, Middlesex Guildhall, Westminster, S.W.
,, 13	Glasgow—Rebuilding Station Offices	Caledonian Railway Co.	Company's District Engineer, 16 Killermont Street, Glasgow.
,, 13	Richmond, Surrey—Three Workmen's Dwellings	Town Council	J. H. Brierley, Town Hall, Richmond.
,, 13	Sleaford, Lincs—Two pairs of Cottages	Committee of Kesteven County Asylum.	J. Clare, County Architect, Sleaford.
,, 14	Barming Heath, nr. Maidstone—Infectious Diseases Hospital	County Asylums Committee	W. J. Jennings, 4 St. Margaret's Street, Canterbury.
,, 14	Castleton, Rochdale—Library	Public Libraries Committee	J. Horsfall, 4 Chapel Walks, Manchester.
,, 15	Greenock—Hospital	Hospital Board	Colin Macculloch, Municipal Buildings, Greenock.
,, 15	Reighley—Training-room	Eastwood Council	W. Bailey, Tanfield Buildings, Bradford.
,, 15	Cardiff—School	Education Committee	James & Morgan, Charles Street Chambers, Cardiff.
	ENGINEERING:		
March 9	Goring-on-Thames—Gasholder	Thames Valley & Goring Water & Gas Co.	Offices of Company, 20 Bucklersbury.
,, 10	Selby—Boring	Urban District Council	P. Griffiths, 54 Parliament Street, S.W.
,, 11	Uxbridge—Well Pumps, &c.	Urban District Council	F. S. Courtney, 25 Victoria Street, S.W.
,, 11	Brighouse—Widening Bridge	Corporation	S. S. Haywood, Municipal Offices, Brighouse.
,, 11	Broadstairs—Engine	Urban District Council	P. Griffiths, 54 Parliament Street, S.W.
,, 11	Portrush, Ireland—Sand Filter	Urban District Council	Council Offices, Town Hall, Portrush.

Complete List of Contracts Open.—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	ENGINEERING—*cont.*		
March 13	Axbridge—Waterworks	Rural District Council	A. Powell, 3 Unity Street, College Green, Bristol.
,, 13	Glasgow—Bridge Superstructure Renewals	Caledonian Railways Co.	Company's District Engineer, General Station, Perth.
,, 13	Edinburgh—Electricity Meters, &c.	Council	Engineer's Office, 5 Dewar Place, Edinburgh.
,, 13	Bristol—Swing Bridge	Docks Committee	W. W. Square, Cumberland Basin, Bristol.
,, 13	Glasgow—Reconstruction of Station	Caledonian Railway Co.	Company's Engineer, Buchanan Street Station, Glasgow
,, 13	Kinver, Staffs—Water Supply	Rural District Council	Council Offices, Kinver, Staffs.
,, 13	Park Royal—Switchboards, &c.	Great Western Railway Co.	Kennedy & Jenkin, 17 Victoria Street, S.W.
,, 14	Llandyfodwg and Llantrisant—Bridge	Urban District Council	Council Offices, Bryn Menin, near Bridgend.
,, 14	Swindon—Water Supply and Sewerage Works	Corporation	H. J. Hamp, Town Hall, Swindon.
,, 14	Farnham—Gas Mains	Gas Committee	Company's Office, East Street, Farnham.
,, 14	Liverpool—Conduit	Water Committee	Water Engineer's Office, Municipal Buildings, Liverpool.
,, 14	Truro—Sewerage Works, &c.	Rural District Council	A. E. Mawes, Preston.
,, 15	London, S.W.—Electrical Stores	Fulham Borough Council	Town Clerk, Town Hall, Fulham.
,, 16	Gloucester—Plant	Electricity Supply Committee	G. S. Blakeway, Guildhall, Gloucester.
,, 21	Chipping Norton and King's Sutton—Bridge	Gt. Western Railway Co.	Engineer's Office, Paddington, W.
,, 21	Stonehaven, N.B.—Extension of Harbour	Harbour Trustees	Clerk to Trustee, Stonehaven.
,, 24	Poole—Ferry Boat	Town Council	Town Clerk, Poole.
,, 27	Grindleford and Rowsley, Derby—Aqueduct Works	Derwent Valley Water Board	E. Sandeman, Engineer to Board, Bamford, near Sheffield.
,, 31	Shanghai—Electric Tramways	Municipal Council	J. Poor & Co., 63 Leadenhall Street, E.C.
April 1	Lulea, Sweden—Dredging	—	Harbour Office, Lulea, Sweden.
,, 10	St. George's Harbour, Bermuda—Deepening, &c., Channel	Government	Coode & Son & Matthews, 9 Victoria Street, S.W.
May 1	Suakin (Red Sea)—Lighthouse	Ports and Lights Administration	Deputy-Controller-General, Ports and Lights Administration, Alexandria, Egypt.
	IRON AND STEEL:		
March 9	Carlisle—Iron and Steel	Corporation	H. C. Marks, 36 Fisher Street, Carlisle.
,, 9	Ashborne, Derby—Iron Cattle Pens	Urban District Council	W. Stringfellow, Town Hall, Ashborne.
,, 9	Birmingham—Brass Fittings, &c.	Corporation	G. H. Barber, City Gas Offices, Council House, Birmingham.
,, 9	London—Cast-iron Fire-Alarm Indicators	London County Council	Clerk to Council, County Hall, Spring Gardens, S.W.
,, 10	Brumby and Frodingham—Pipes, &c.	Urban District Council	A. Atkinson, Brigg.
,, 10	Wrexham—Ironmongery	Rural District Council	J. O. Bury, 9 Temple Row, Wrexham.
,, 10	Melbourne, Australia—Rails, &c.	Victorian Railway	Agent-General for Victoria, 142 Queen Victoria Street, E.C.
,, 11	Haslingden, Lancs—Iron Castings, &c.	Town Council	J. S. Green, Borough Surveyor, Haslingden.
,, 13	Axbridge—Pipes	Rural District Council	A. Powell, 3 Unity Street, College Green, Bristol.
,, 13	London, S.W.—Ironmongery	Urban District Council	G. B. Tomes, Council Offices, High Street, Mortlake.
,, 14	Belfast—Iron and Steel	Works Committee	Superintendent of Works Offices, Town Hall Street, Belfast.
,, 15	Blackpool—Iron and Steel	Highways Committee	J. S. Brodie, Town Hall, Blackpool.
,, 15	Colchester—Ironmongery	Elec. Light & Power Committee	A. R. Sillar, 36 Stanwell Street, Colchester.
,, 16	Reading—Tools and Ironmongery, &c.	Corporation	J. Bowen, Town Hall, Reading.
,, 17	Cheltenham—Ironmongery	Corporation	J. S. Pickering, Municipal Offices, Cheltenham.
,, 18	Burnley—Ironwork, &c.	Highways & Sewage Committee	G. H. Pickles, Town Hall, Burnley.
,, 27	Welwyn, Herts—Pipes	Rural District Council	H. Walker & Son, Albion Chambers, King Street, Nottingham.
	PAINTING AND PLUMBING:		
March 9	Birmingham—Paints	Corporation	G. H. Barber, City Gas Offices, Council House, Birmingham.
,, 10	Salford—Whitewashing at Infirmary	Guardians	Steward, Infirmary, Salford.
,, 11	Bristol—Painting Work at Wards, &c.	Health Committee	City Engineer, 63 Queen Square, Bristol.
,, 14	Wembley, Middlesex—Oils, &c.	Urban District Council	W. Bagshaw, Public Offices, Wembley.
,, 14	Belfast—Oils and Paints	Works Committee	Superintendent of Work's Office, Townhall Street, Belfast.
,, 15	Colchester—Oils, &c.	Elec. Light & Power Committee	A. R. Sillar, 36 Stanwell Street, Colchester.
,, 16	Reading—Oils and Paints	Corporation	J. Bowen, Town Hall, Reading.
,, 17	Cheltenham—Oils and Colours	Corporation	J. S. Pickering, Municipal Offices, Cheltenham.
	ROADS AND CARTAGE:		
March 9	Fenton, Staffs—Macadam	Urban District Council	S. A. Goodall, Town Hall, Fenton.
,, 9	Carlisle—Concrete Flags, &c.	Corporation	H. C. Marks, 36 Fisher Street, Carlisle.
,, 9	Tamworth—Broken Granite, &c.	Town Council	F. E. G. Bradshaw, 36 Aldergate, Tamworth.
,, 10	Dorchester—Repairs to Roads	Rural District Council	F. H. Polkinghorne, 2 Dagmar Road, Dorchester.
,, 10	Flaxton, Yorks—Road Materials	Rural District Council	J. Peters, 4 New Street, York.
,, 10	Pontnewydd, Wales—Widening, &c., Parade	Abersychan U.D.C.	Council Offices, Abersychan.
,, 10	Wrexham—Cement and Flags	Town Council	J. Congland, Willow Road, Wrexham.
,, 11	Belford, Northumberland—Road Works	Rural District Council	C. A. Lake, Belford.
,, 11	Tadcaster—Road Materials, &c.	Rural District Council	T. Scott, Aberford, near Leeds.
,, 11	Belper—Road Materials	Rural District Council	R. C. Cordon, Duffield, near Derby.
,, 11	Brighouse, Yorks—Granite Setts	Corporation	S. S. Haywood, Municipal Offices, Brighouse.
,, 11	Stafford—Slag	Council	W. Morgan, 4 Martin Street, Stafford.
,, 13	Eccles, Lancs—Road Materials	Corporation	T. S. Picton, Borough Surveyor, Eccles.
,, 13	Lichfield, Staffs—Granite	Rural District Council	C. O. Rawstron, District Surveyor, Lichfield.
,, 13	Mountain Ash, Wales—Street Works	Urban District Council	W. G. Thomas, Council Offices, Mountain Ash.
,, 13	Ruthin, Denbigh—Roadstone, &c.	County Council	E. W. Jones, District Surveyor, Wrexham.
,, 13	London, S.W.—Broken Guernsey Granite	Barnes U.D.C.	G. B. Tomes, Council Offices, High Street, Mortlake.
,, 14	London, E.C.—Paving, &c.	Shoreditch Borough Council	H. M. Robinson, Town Hall, Old Street, S.E.
,, 14	Littleborough, Lancs—Road Materials, &c.	Urban District Council	Council Offices, Hare Hill, Littleborough.
,, 14	Long Crendon, Thame—Broken Granite	Rural District Council	E. Parry, Long Crendon, Thame.
,, 14	St. Helens, Lancs—Road Materials	Highways Committee	G J. C. Broom, Town Hall, St. Helens.
,, 14	Hampton, Middlesex—Road Materials	Urban District Council	Council Offices, Hampton, Middlesex.
,, 15	Blackpool—Granite, &c.	Highways Committee	J. S. Brodie, Town Hall, Blackpool.
,, 15	Ledbury—Road and Sewers	Freehold Building Society	R. G. Gurney, Surveyor, Worcester Road, Ledbury.
,, 15	Newbury—Road Repair	Rural District Council	H. S. Talbot, Cold Ash, Newbury.
,, 15	Tutbury, Burton-on-Trent—Road Materials	Rural District Council	C. H. Chamberlain, Union Offices, Burton-on-Trent.
,, 15	Wimblington, Cambs—Road Materials	Rural District Council	A. W. Broker, Surveyor, Wimblington.

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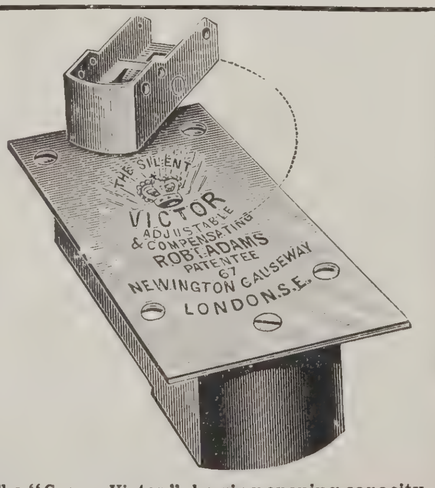

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DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED
		ROADS AND CARTAGE *–cont.*		
March	15	Walsall—Broken Granite, &c.	Rural District Council	W. P. Young, Council Offices, Rushall, Walsall.
"	16	Eastbourne—Road Materials	Rural District Council	T. E. V. Kirtland, 92 Terminus Road, Eastbourne.
"	16	Reading—Granite, &c.	Corporation	J. Bowen, Town Hall, Reading.
"	16	London, S.E.—Stock Bricks	Lambeth Borough Council	H. Edwards, 346 Kennington Road, S.E.
"	16	Belfast—Artificial Flags	Works Committee	Superintendent of Works' Office, Town Hall Street, Belfast.
"	16	Ormskirk, Lancs—Road Materials	Rural District Council	C. Law-Green, Surveyor to Council, Wigan Road, Ormskirk.
"	16	Reading—Granite, &c.	Corporation	J. Bowen, Town Hall, Reading.
"	17	Cheltenham—Broken Stone, &c.	Corporation	J. S. Pickering, Municipal Offices, Cheltenham
"	18	Burnley—Flags, &c.	Highways & Sewage Committee	G. H. Pickles, Town Hall, Burnley.
"	18	Epsom—Kerbing and Channelling	Urban District Council	E. R. Capon, Bromley Hurst, Church Street, Epsom.
"	21	Tendring, Essex—Flints	Highways Committee	J. Bell, Highways Surveyor, Wheeley, Colchester.
"	22	Leeds—Improvement Works	Unhealthy Areas Committee	City Engineer's Office (Unhealthy Areas Improvements Department), Municipal Buildings, Leeds.
"	22	Strood, Kent—Road Materials, &c.	Rural District Council	J. E. Povey, Clerk, Workhouse, Strood.
		SANITARY:		
March	9	Tamworth—Disinfectants	Town Council	F. E. G. Bradshaw, 36 Aldergate, Tamworth.
"	10	Hamilton, N.B.—Drainage Works	District Committee	W. S. Douglass, District Offices, Hamilton, N.B.
"	10	Ditchling, Sussex—Sewage-disposal Works	Chailey R.D.C.	Beesley, Son & Nichols, 11 Victoria Street, London, S.W.
"	13	Blackburn—Reconstructing Privies, &c.	Health Committee	W. Stubbs, Municipal Offices, Blackpool.
"	13	Mountain Ash—Sewer	Urban District Council	W. G. Thomas, Council Offices, Mountain Ash, Wales.
"	13	Hackney—Destructor Clinker	Borough Council	L. L. Robinson, Electricity Works, Millfields Road, Clapton.
"	13	London, S.W.—Removal of Refuse	Barnes U.D.C.	G. B. Tomes, Council Offices, High Street, Mortlake.
"	13	Wargrave, Berks—Sewage-disposal Works	Rural District Council	R. Hassard, 1 Victoria Street, S.W.
"	14	Belfast—Scavenging Brushes, &c.	Works Committee	Superintendent of Works' Office, Town Hall Street, Belfast.
"	15	Walsall—Disinfectants	Rural District Council	W. P. Young, Council Offices, Rushall, Walsall.
"	15	Balby-with-Hexthorpe, Yorks—Scavenging	Urban District Council	Surveyor, High Road, Balby.
"	17	Cheltenham—Disinfectants	Corporation	J. S. Pickering, Municipal Offices, Cheltenham.
"	18	Epsom—Disinfectants	Urban District Council	E. R. Capon, Bromley Hurst, Church Street, Epsom.
"	22	Cefn, near Ruabon—Sewage-disposal Works, &c.	Wrexham U.D.C.	J. P. Evans, Argyle Chambers, Wrexham.
"	29	London, S.E.—Removal of Refuse	Trustees of Borough Market	Market Offices, Cathedral Street, Southwark.
		TIMBER:		
March	9	Birmingham—Wood Screws	Corporation	G. H. Barber, City Gas Offices, Council House, Birmingham.
"	16	Reading—Wood Blocks	Corporation	J. Bowen, Town Hall, Reading.
"	14	Sutton Coldfield—Timber	Corporation	W. A. H. Clarry, Council House, Sutton Coldfield.
"	17	Cheltenham—Timber	Corporation	J. S. Bickering, Municipal Offices, Cheltenham.

List of Competitions Open.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
March	30	London, S.W.—Municipal Buildings	——	£1	H. J. Smith, Town Hall, Kennington, S.W.
"	31	Cnippenham—School	£30 & £20	——	W. Pullinger, Education Department, County Offices, Trowbridge.
"	31	London, S.E.—Clock Tower	£10, £15 & £10	——	Thomson & Pomeroy, 49 Hill Road, Wimbledon.
"	31	Trowbridge—School	£30 & £20	——	W. Pullinger, Education Department, County Offices, Trowbridge
June	1	Letchworth (Garden City)—Cottages	——	——	W. O. Cooper, 347 Birkbeck Bank Chambers, High Holborn.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

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ABLE ASSISTANT (24) seeks situation. Varied experience; working drawings, details; good knowledge quantities, specifications, surveying, levelling. Well up construction; careful draughtsman. St. R.I.B.A.—F. B. H., "Elmwood," London Road, High Wycombe. 986

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ARCHITECT and CIVIL ENGINEER'S ASSISTANT desires ENGAGEMENT. 10 years' practical experience of surveys, drawings, quantities, &c. Excellent references.—Box 992, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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ARCHITECT'S ASSISTANT with twelve years' experience, desires ENGAGEMENT. Thoroughly reliable. Competent in all branches.—H. W. A., Belinda, New Borough, Wimborne. 984

ARCHITECT'S ASSISTANT (27) desires engagement, 11 years' experience; working drawings, details, designs, specifications, quantities, levelling. —J. W., 8, Rylett Crescent, W. 970

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ARCHITECT'S ASSISTANT seeks ENGAGEMENT. Details and contract drawings, surveys and levelling, knowledge of quantities and specifications, experienced in schools; salary moderate. —E. A. DUKIN, Barrowcliff & Allcock, Architects, Loughborough. 1000

ARCHITECT'S JUNIOR ASSISTANT, just completed 3½ years' articles, neat tracer and colourist. Prob. R.I.B.A. Salary £1.—A. F. C., 46, King Henry Road, N.W. 951

ARCHITECT'S JUNIOR ASSISTANT (22); 4½ years' London experience; well up in office routine; salary 25s.—ARCHITECT, 65, Talgarth Road, West Kensington. 980

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BRICKWORK and POINTING.—Rod or lump. Town or Country. Good refs.—H. H., 7, Newton Road, Isleworth. 962

BRICKWORK and POINTING WANTED. Town or country. rod or lump, good references.—H. H., 31, Stanley Road, East Sheen, S.W. 933

BRICKWORK, GAUGEWORK, TILING and POINTING WANTED. Labour only. Large job preferred. First-class references from leading London builders.—A., 110, Vassall Road, Stockwell, S.W. 968

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BUILDER'S CLERK disengaged. Prime cost, accounts, bookkeeping, drawings, quantities and usual office routine. Recommended as energetic, trustworthy and capable. Salary moderate.—S. E., 183, The Grove, Hammersmith, W. 946

CARPENTER.—Young man wants a job at bench or jobbing, town or country.—G. T., 42, Lyham Road, Brixton Hill. 973

CLERK-BOOKKEEPER, or position of trust. Home or abroad. 15 years' office experience, smart, energetic, and of gentlemanly appearance. Good references; age 34.—F. E. P., 34, Beckhampton Road, Norbiton. 990

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March 11th. Fourth Spring visit to University Hospital Extension, by kind permission of the Architect, Mr. PAUL WATERHOUSE. Members to meet at the Main Entrance in Gower Street, at 2.30 p.m.

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H. T. WAKELAM,
County Architect.
Middlesex Guildhall,
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February 21st, 1905.

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(*Continued on p. xx.*)

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G. Boyson	5,246	16	5
T. P. Willan	5,064	14	9
G. Clarke & Sons	5,047	0	4
C. Braddock & Co.	5,025	0	0
W. Woodfine	5,017	3	8
W. Owen	4,989	13	9
W. H. Worthington	4,921	16	3
Johnson & Hindley	4,847	0	0
W. Snape & Sons	4,578	19	0

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending March 3rd twenty-one failures in the building and timber trades in England and Wales were gazetted.

R. D. PETTIT, builder, Cherryhinton. R.O. Feb. 21st.

A. MABBY, builder, St. Anstell. R.O. Feb. 25th.

F. G. POWLEY, builder, London, E.C. Adj. Feb. 24th.

M. WILSON, builder, Leeds. R.O. Feb. 20th.

H. BROOKES, painter and plumber, Birkenhead. P.E., Birkenhead C.C., March 8th, at 11.

T. G. BARLOW, carpenter and decorator, Wimborne. R.O. Feb. 24th.

W. H. CHEDZOY, builder and plumber, Bristol. Adj. Feb. 24th.

W. BRIDGE, builder, All Saints, Hunts. R.O. Feb. 24th.

M. A. HURST, builder and contractor, Finchley. P.E., Barnet Town Hall, March 23rd, at 11.

R. MILLER, contractor, Kensal New Town, London. Adj. Feb. 20th.

J. & J. MURPHY, builders, East Ham and Catford. P.E., London Bankruptcy Court, April 7th, at 11.30.

F. C. STYLES, builder and contractor, Sunbury Adj. P.E., Kingston C.C., March 14th, at 2.30.

C. J. WYNN, carpenter and builder, Pontypool. R.O. Feb. 21st.

J. W. BENHAM, builder and decorator, Richmond. P.E., Wandsworth C.C., March 9th, at 12.

E. THOMAS & Co., builders, Neath. First meeting, O.R.'s, Swansea, March 9th, at 12.30.

H. BLEZARD, builders' merchant, Blackburn. P.E., Blackburn C.C., March 8th, at 10.30. First meeting, same, at 10.45.

J. W. JACKSON & Co., painters and decorators, Lincoln. R.O. Feb. 20th. P.E., Sessions House, Lincoln, March 30th, at 3.

A. PERRY, monumental mason, Fulham. R.O. Feb. 23rd. First meeting, London Bankruptcy Court, March 10th, at 12. P.E., same, March 31st.

W. YOUNG, builder and contractor, Twyford. Gross liabilities £3,502; £2,778 expected to rank for dividend; assets £498; deficiency £2,279.

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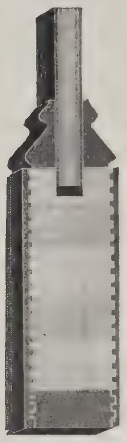

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THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD.

March 15, 1905. Vol. 21, No. 527. 6, Great New Street, Fetter Lane, E.C.

Summary.

Dalmeny Church is one of the most beautiful examples of Norman architecture remaining in Scotland, but it is a great pity that the interior is marred by incongruous modern fittings. (Page 134.)

A quay 1¼ miles long is to be constructed about six miles above Gravesend at a cost of £1,000,000. (Page 145.)

A deadlock has occurred between the master and operative painters at Aberdeen in regard to the date of signing by-laws and the employment of labourers on painting, glazing and papering work. (Page 145.)

Speaking at Penryn last week Mr. Douglas Hall said that on every £1,000 granite contract £666 went in wages, and for that reason he maintained there should be a heavy protective duty on granite. (Page 145.)

The German industrial association has petitioned the Government to allow steel-framed buildings to be erected in Berlin of a greater height than the present limit of 72·18ft. The Government, however, flatly refuse to grant such a request, for reasons of public health, water-supply and fire protection. (Page 137.)

Sir Aston Webb makes a special appeal for the Architects' Benevolent Society. Of all the architects practising in the United Kingdom, not more than 5 per. cent. contribute to it. (Page 138.)

Mr. H. V. Lanchester read a paper on law courts before the Architectural Association last Friday, in the course of which he said that the witness-box should not be less than 10ft. nor more than 12ft. from the judge, and within 12ft or 14ft. of the examining barrister and the jury. If much further than this the witness's replies might not carry, and the facial expression, which was sometimes important, might escape observation. At the new Cardiff law courts the witness-box had been placed on the jury side. (Page 140.)

In a case heard last week in the King's Bench Division the jury awarded £2,000 damages for injury done to a house in Highbury Crescent by subsidence due to the "tube" railway. (Page 137.)

In the course of a paper on sewage treatment which he read before last week's meeting of the Sheffield Society of Architects Mr. A. E. Turnell said a cultivation tank and bed could be built at very small cost, and sewage treated by this method might be turned on the land or into a stream without fear of further putrefaction or of causing a nuisance to adjoining estates. (Page 139.)

Reinforced Concrete. The most appropriate name by which we shall know the combination of metal and concrete in due proportion to best resist stresses has been often debated and seems to be troubling many persons. The French, who were first to elaborate this system of construction, called it "ciment armé," from which we get the term "armoured concrete," but as this suggests an external metal sheathing it is distinctly inappropriate. "Ferro-concrete" likewise seems hardly the word, because it would apply more nearly to a concrete made with a rust cement. In the United States the term "concrete steel" is often adopted, but steel is a kind of concrete from a metallurgical point of view, and this therefore seems unscientific. "Framed" and "trussed" concrete are two other words that have been suggested, but concrete cast in moulds or on centering is, as it were, framed; while beams and floors only are trussed and not columns. "Reinforced concrete" seems to be the best term. Although not altogether descriptive, it is wide and distinctive enough, we think, and is already generally accepted.

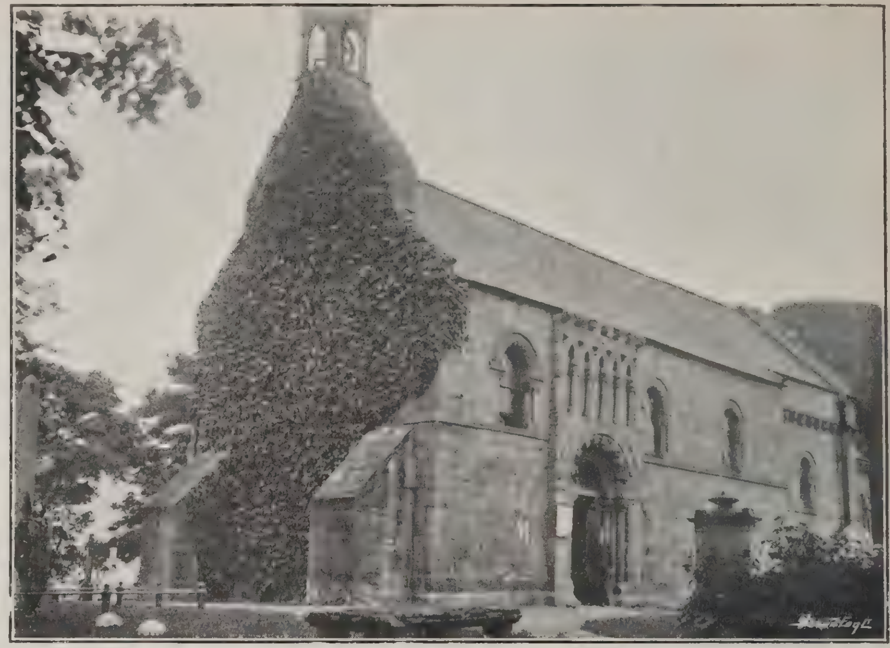
The Greatest Discovery in Egypt. WITHIN the last decade many wonderful discoveries have been made in Egypt, but they all pale in comparison with the tomb of Yua and Thua (parents of the famous Queen Teie) which has just been discovered by Mr. Theodore M. Davis in the valley of the Tombs of the Kings. The announcement of the discovery was made on Thursday last in the "Times," by whom it is characterized as far surpassing any that has ever been made in Egypt, and such that has not fallen to the lot of any explorer since Egypt was opened to European research. The tomb is about 30ft. long, 15ft. wide and 8ft. high, and remains exactly as it was in the 18th Dynasty (*circa* B.C. 2000). It has never been visited or plundered since that remote age, and it is still filled with the royal treasures—the untouched and richest spoil of ancient Egypt. Mummy cases encrusted with gold, huge alabaster vases of exquisite form, chairs and boxes brilliant with paint and gilding, even a pleasure chariot with its six-spoked wheels still covered by their wooden tires, were found lying piled one upon the other in bewildering profusion. It was some days before the band of explorers could even ascertain the full extent of the treasures which the tomb contained, and it will be some time yet before the work of thoroughly clearing out the tomb can be accomplished. Meanwhile it has revealed one striking fact—the ostentatious, not to say vulgar, display of wealth which distinguished Egyptian society in the later days of the 18th Dynasty, when Egypt was the California of the civilized world. There was nothing, however mean or insignificant, which was not literally plated with the gold of the desert mines.

A Valuable Addition to the British Museum. A MOST valuable addition to the architectural treasures of the British Museum has just been made—namely, the complete shaft of one of the columns at the entrance to the Treasury of Atreus at Mycenæ. If will soon be set up in position in the Archaic room, when all interested in Grecian architecture should not fail to take advantage of seeing for the first time this most complete as well as most highly-decorated example known of the Mycenæan column, with its downward taper outline, the immediate ancestor of the developed Greek order. The story of how it came into the hands of the Museum authorities is interesting. At the beginning of the nineteenth century it appears that the second Marquis of Sligo visited Greece and obtained permission to excavate there. Unfortunately there is no detailed record of his researches, but whatever finds he made seem for the most part to have been removed to the family estate of Westport, county Mayo, and it was while studying these last year that the Earl of Altamont, son of the present Marquis of Sligo, came to the conclusion that certain columns in the collection were of unusual importance. He made careful drawings and photographs of them, which were brought to the British Museum, and the probability that they were the missing decorations of the Treasury of Atreus was at once made evident. Lord Altamont soon afterwards paid a visit to Mycenæ for the express purpose of comparing his measurements with the traces left *in situ*, and the result leaves hardly any doubt that the surmise is correct. Thus, with the fragment found at Argos in 1812 by Baron Haller, the companion of Cockerell in the famous enterprise at Ægina, the erection of this shaft is made possible, while a complete restoration of the base, capital and abacus can be made from a combination of the scattered fragments in the museums at Berlin, Carlsruhe and elsewhere. The story of this shaft resembles that of the fragment of the Parthenon frieze discovered by the late Dr. Murray in an Essex garden, and furnishes another instance of the wonderful erudition of leading archæological authorities.

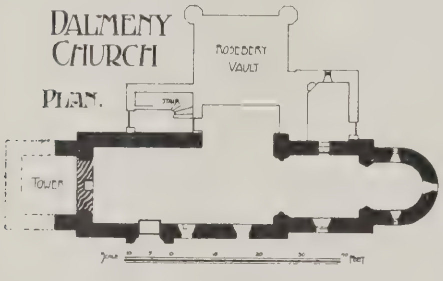
DALMENY CHURCH

By J. JEFFREY WADDELL.

ONE of the most beautiful examples of Norman architecture remaining in Scotland is the church of Dalmeny, situated near the residence of the Earl of Rosebery and within two miles of the south end of the Forth Bridge. It was probably erected about 1130 by Gospatric, the second earl, generally styled the brother of Dolphin, and was dedicated to St. Cuthbert. As is customary, it occupies a site close to the ancient mote or castle of the Norman landholder. It is built in the style which characterizes other remains of this period; several of the details of this church, indeed, suggest that its designer—whoever he may have been—must have been familiar with the work which at that time was being carried on at the great cathedral of Durham, from which the beautiful nave of Dunfermline Abbey (only a few miles from Dalmeny, on the north side of the Forth) was also modelled. Its plan consists of a vaulted choir with an eastern semicircular apse, which is also vaulted, and a nave measuring 42ft. 6ins. by 17ft. 8ins. Two deep buttresses project from the west gable of the nave; these have been shown recently by Mr. P. Macgregor Chalmers* to be part of the wall of a great western tower which must have been similar to that of the tenth-century church of St. Regulus at St. Andrews. The plan of Dalmeny church somewhat resembles that of St. Regulus, but Dalmeny, being the later, shows its date and development in the addition of a chancel between the nave and the apse. The base of the western tower of Dalmeny formed part of the interior of the church, with which it was connected by means of a large arch. Externally the tower must have added great dignity to the church and been a landmark for miles around. It must have been destroyed in pre-Reformation days, as there is no mention of it in later times. Buildings have been erected abutting on the north side of the church in more modern times which do not improve its appearance and have destroyed part of the north wall of the nave. They occupy the probable site of the sacristy. Galleries have also been added to the church, its interior has been lathed and plastered, the roof of the choir has been raised, a belfry has been erected over the west gable, and the modern fittings, as will be seen from the photograph of the interior, are entirely at variance with the plan and architectural arrangement of the building.



VIEW FROM SOUTH-WEST.



In spite, however, of these disfigurements, the original beauty of the Norman architect's ideals are still apparent in the work. He must have been a thorough artist, for he has made the most of everything, yet always stayed his hand at the proper place and allowed the plain ashlar stonework to tell its own tale and enhance and act as a foil to the decorated portions, in which respect his work might well serve as a model and corrective to our pretentious modern structures.

The windows are all single lights, beautifully proportioned and enriched with angle shafts having carved capitals and chevron ornament around the arches. The sills rest on a richly sculptured string-course, and the wall-heads of the church are decorated with a series of carved masks in the typical Norman fashion.

The doorway is very rich. Here the architect has concentrated his ornament where it would have most effect. Two shafts enrich the jamb; the outer one circular, the inner one octagonal. The semicircular tympanum has gone, but the arch with its two orders and hood-mould remain, and many of the sculptured carvings are still in a state of tolerable preservation. These elaborate designs and figures no doubt had a world of meaning for the people of that Norman time, though some of them are unintelligible to us now. The upper portion of this projecting doorway is decorated with a beautiful arcade of five divisions with interlacing arches and double columns having carved capitals, and surmounted by a cornice of large carved masks. The whole forms a most satisfactory piece of design.

The interior, though it is at present disfigured by the fittings, lath and plaster and galleries, is still very fine. The rich arch between the nave and choir is of three orders

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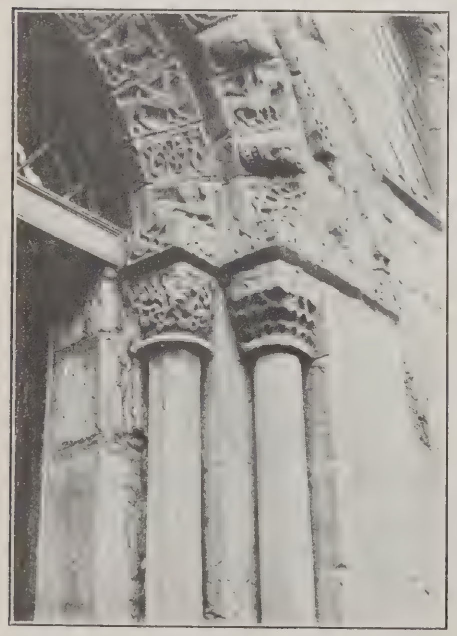
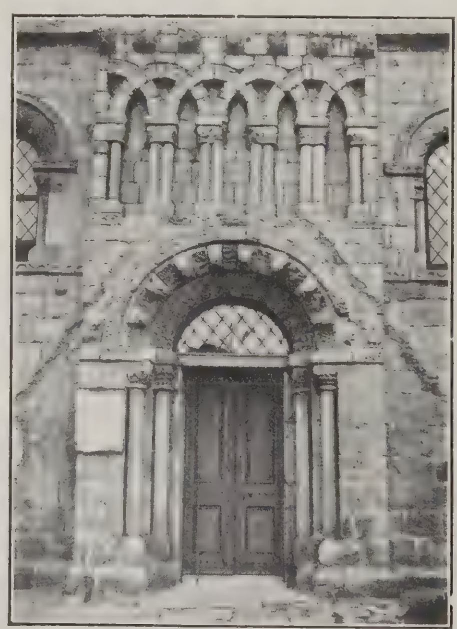
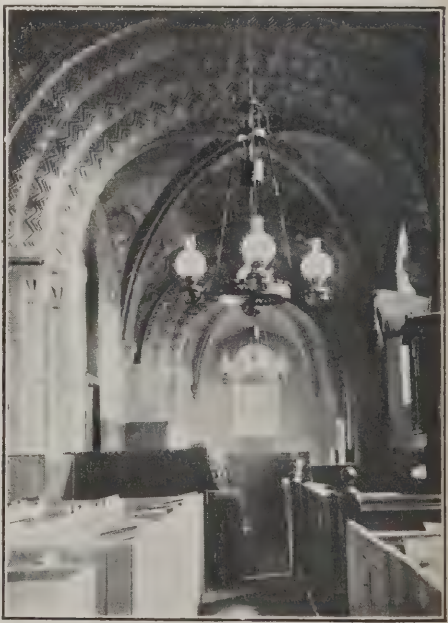
* See his "Dalmeny Kirk," to which I am indebted for information on several other previously unknown points.



DETAIL OF JAMB.



SOUTH DOORWAY.



INTERIOR, LOOKING EAST.

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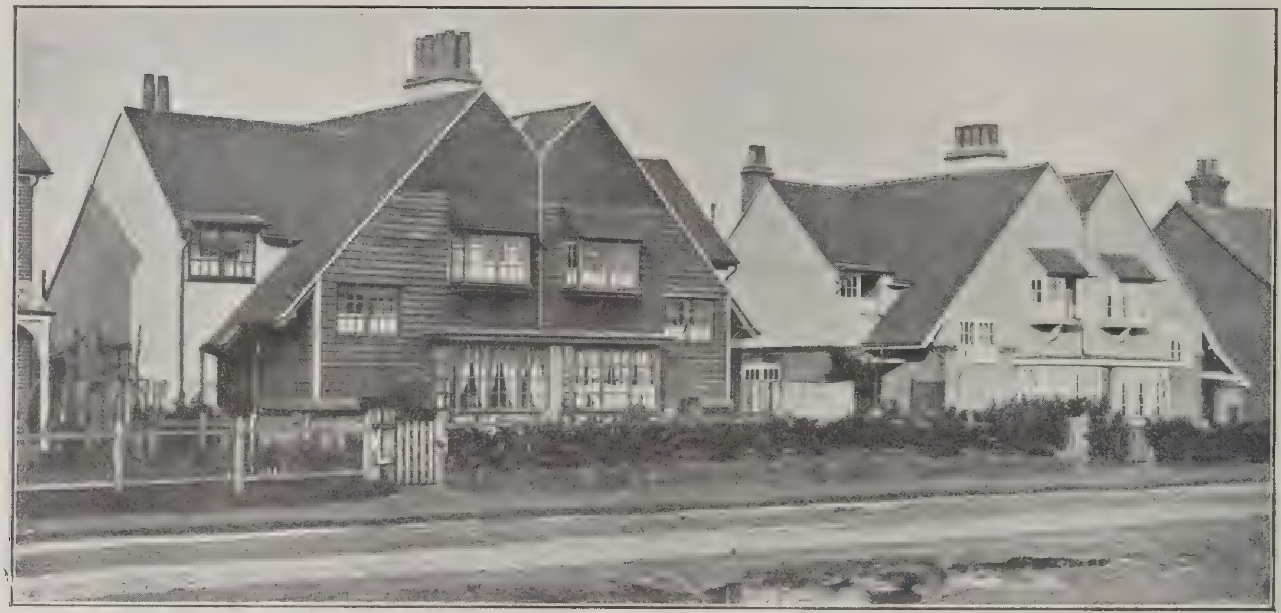
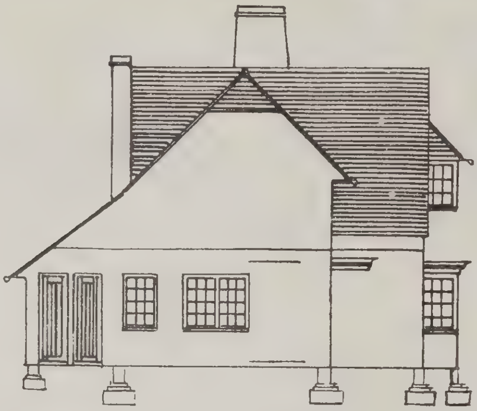
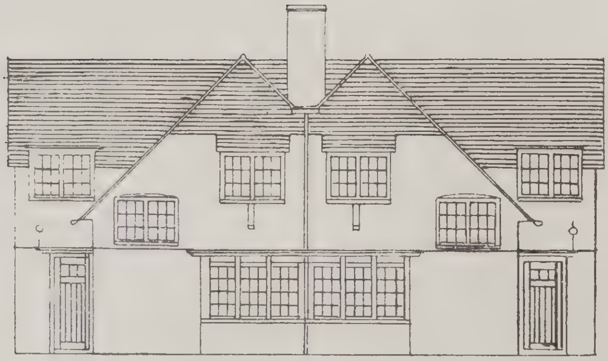


COTTAGES ON THE RIDGWAY ROAD,
FARNHAM, SURREY.

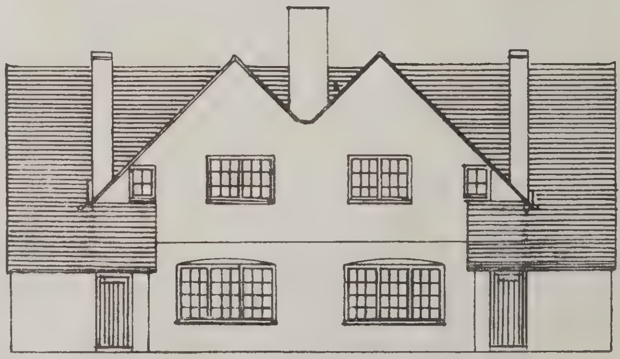
HAROLD FALKNER, ARCHITECT.



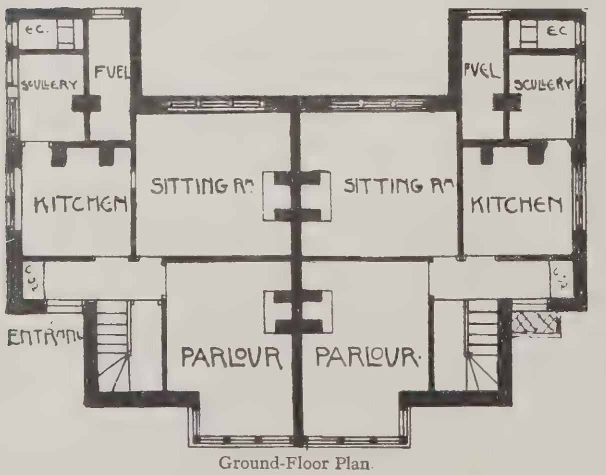
Side Elevation.



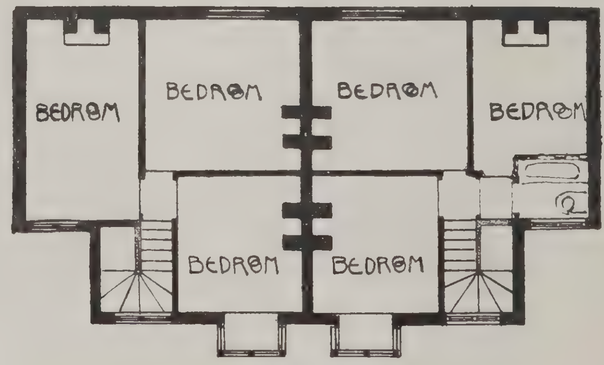
Front Elevation.



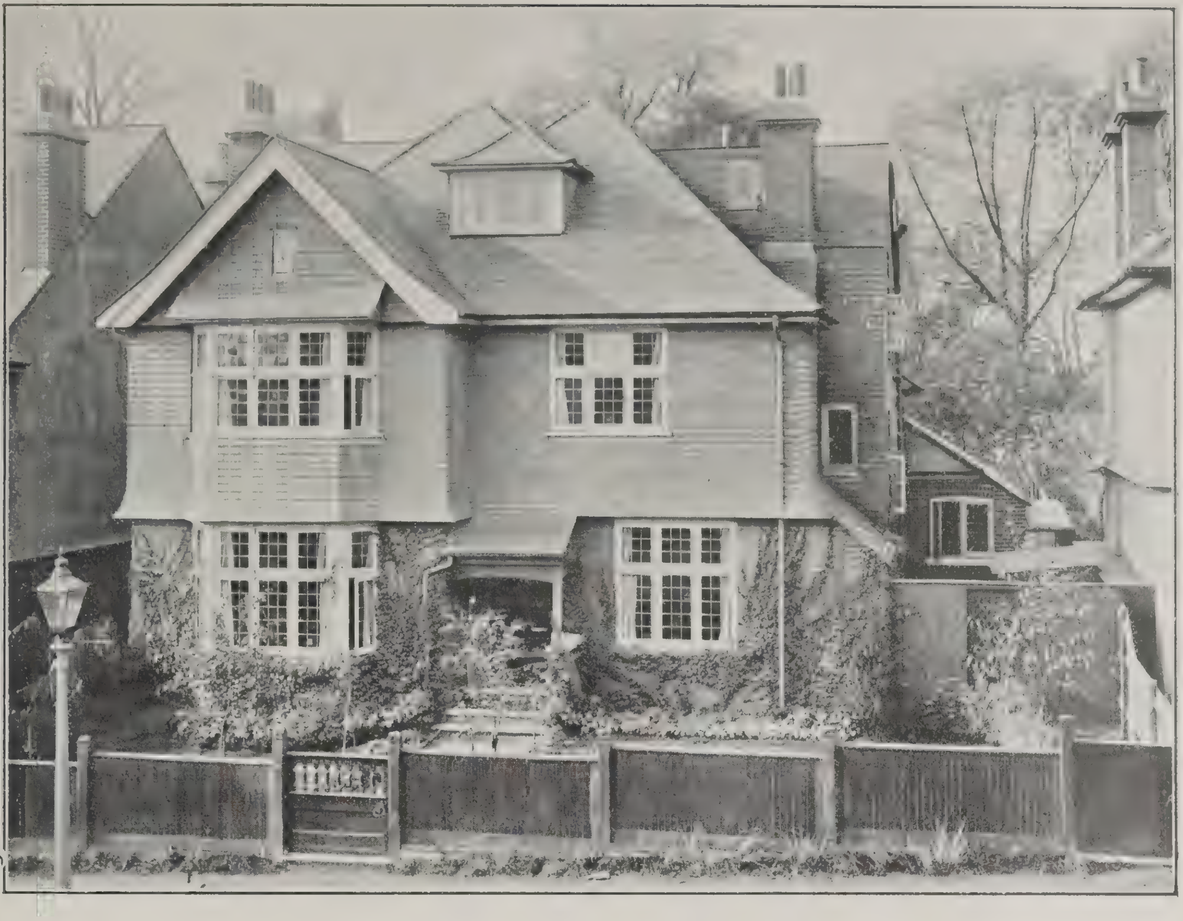
Back Elevation.

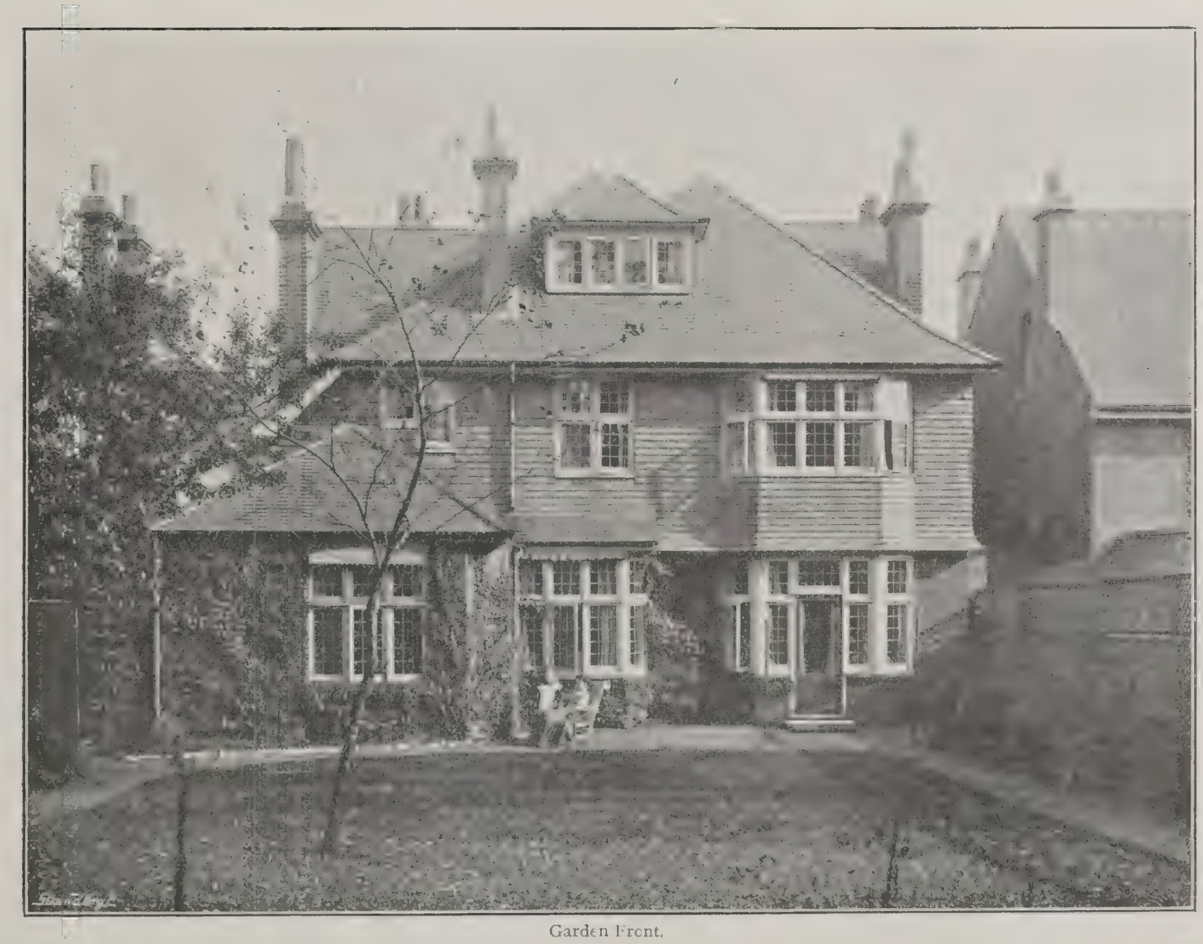


Ground-Floor Plan.



First-Floor Plan.





Garden Front.

NO. 9, OAKCROFT ROAD, BLACKHEATH, S.E. LEONARD V. HUNT, F.R.I.B.A. ARCHITECT.

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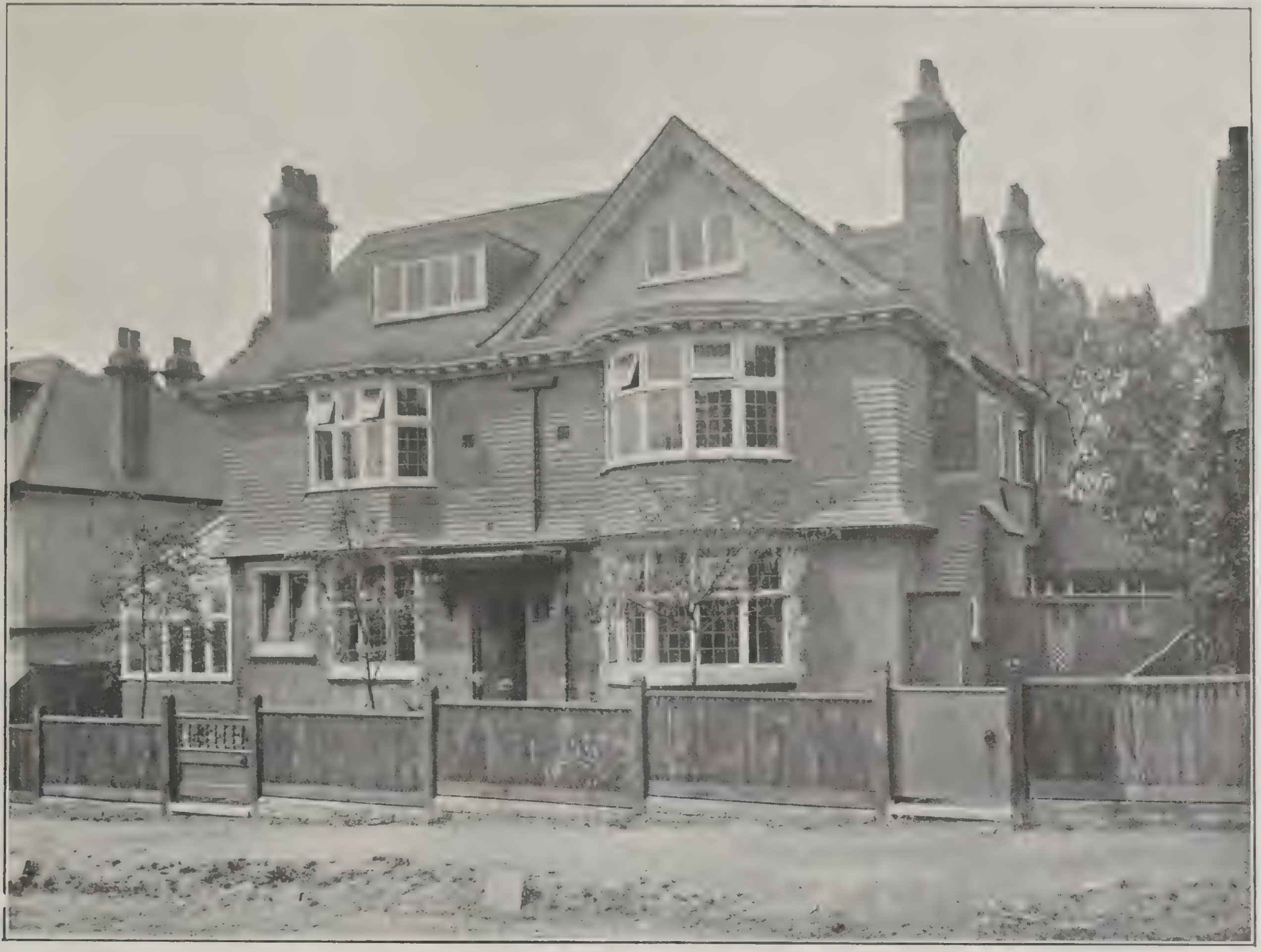


NO. 5, OAKCROFT ROAD, BLACKHEATH, S.E. LEONARD V. HUNT, F.R.I.B.A., ARCHITECT.

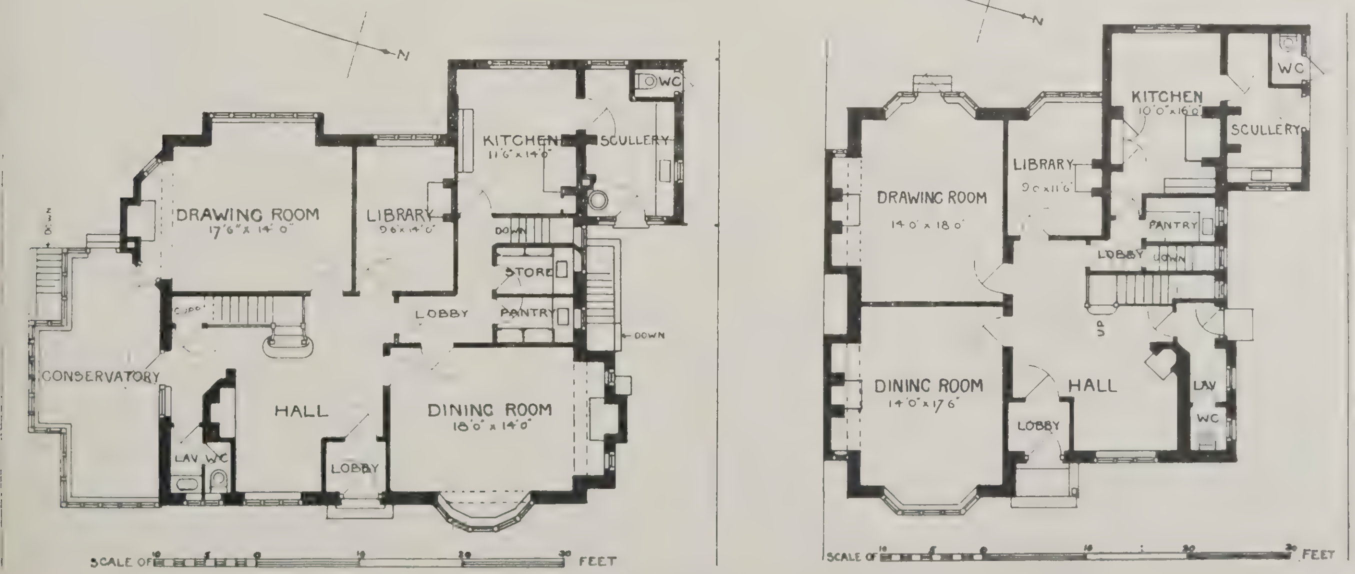
vith hood-mould, that between the chancel nd apse of two orders with hood-mould, and he groin ribs also enriched. Viewed from he west end of the nave, the lines converge hrough the choir to the apse. The interior s undoubtedly the finest of its style in Scotland, and it is a great pity that as it at present stands the original beauty is somevhat marred. Surely in the near future omeone may be found willing to restore his ancient fabric to its original glory, and so nsure its preservation for many years to ome. The work is much needed, and it is o be hoped that it will not be allowed to emain untouched.

The photographs illustrating this article re by Mr. W. Alexander.

OUR PLATES.

THE two houses, Nos. 5 and 9, Oakcroft Road S.E., are situated on the Knoll Estate, close to Blackheath. As will be seen from the plans, the chief feature of each ground floor is the hall arranged as a lounge. Both houses are faced with red bricks up to the first floor and tile-hung above. The staircases are of oak throughout. In the drawing-rooms the floors are laid with rock-maple and in other portions of the ground floors with oak. No. 9 has the hall panelled in oak and oak doors by Mr. John P. White, of Bedford. The conservatory was executed by Messrs. Duncan Tucker, of Tottenham. The cost of the houses worked out at about 10½d. per cubic foot. Messrs Kennard Brothers, of Lewisham, were the general contractors, and Mr. Leonard V. Hunt, F.R.I.B.A., was the architect.

The two pairs of cottages on the Ridgway Road, Farnham, were built about three years ago at a total cost of £1,210. They are of very pleasant aspect, but Mr. Harold Falkner, the architect, says they have not been approved by the working-class for whom they were erected, the British working-man's wife preferring a slate roof, plate-glass arrangement; so that some of them have been modified as indicated on the right-hand bedroom plan. The cottages are built of stock bricks, partly rough-cast, partly weather-boarded, with tile roofs.



NOS. 5 AND 9, OAKCROFT ROAD, BLACKHEATH, S.E.: GROUND-FLOOR PLANS.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Clerk of Works.

Kirkcaldy.—G. M. writes: "Where can I get particulars of the appointments for clerks of works in H.M. Office of Works?"

"The Civil Service Year-Book" and from the Civil Service Commissioners.

Books on Reinforced Concrete.

Sheffield.—E. A. C. writes: "Please give a list of books on reinforced concrete construction, containing all necessary formulæ, details, &c., for the design of such structures."

There are numerous books on the subject in French and German. As regards books in English, a good small one is "Notes on Steel Concrete Construction," by Major J. Winn, R.E. (W. & J. Mackay & Co., Ltd., 176, High Street, Chatham, price 2s. 6d. nett), but the best book is Marsh's "Reinforced Concrete," reviewed on p. 138 of this issue.

Diagrams of Arches and Vaults.

London.—X. writes: "One of the testimonies of study required for the R.I.B.A. final examination is a sheet containing diagrams of arches or groined vaults in brickwork or masonry. Would one of the sheets of Mitchell's 'Building Construction' answer the purpose, or should one go further afield and take examples from measured work?"

It is much the best to take examples from measured work, preferably measuring it for yourself; though a sheet of designed vaulting, such as that by Mr. Ormerod which was illustrated in The Builders' Journal for October 1st, 1902, is difficult to improve upon, whether finished in ink or in pencil and colour. G. A. T. M.

Sketching Prizes; American Architectural Papers.

Harrow.—A. R. B. writes: "(1) Are there any prizes for architectural sketches besides the 'Pugin'? (2) What paper corresponds to The Builders' Journal or The Builder in America, and where can it be procured?"

(1) None that we know of, except the prizes offered by the Architectural Association—including the Architectural Union Co.'s prize of £10—and those offered by the various architectural societies throughout the kingdom. (2) Particulars of the American building and architectural papers will be found on p. 33 of our issue for August 28th, 1901. There is no paper in America corresponding to The Builders' Journal. "The American Architect and Building News" has some good plates, well-written leaders, and oftentimes interesting papers read before American societies, but the news portion is very scanty. It is published weekly, price 50 cents—8 dols. (£2 1s. 4d.) a year post free to this country from 211, Tremont Street, Boston, Mass. "Architecture" (monthly, 30 cents, Forbes & Co., Ltd., 160, Fifth Avenue, New York) is very well produced, being full of excellent reproductions of photographs of current work. "The Architectural Review" (monthly, 50 cents, Bates & Guild Co., 42, Chauncy Street, Boston, Mass.) is similarly well printed, but gives photographs of old work as well. "The Brickbuilder" (monthly, 50 cents, Rogers & Manson, 85, Water Street, Boston, Mass.) is an excellent paper, giving constructional articles, working drawings and photographic reproductions of buildings in "materials of clay." In comparison with them all, however, the English architectural papers are far better value. Quite the best constructional paper of its class published in America is "The Engineering Record, Building Record and the Sanitary Engineer," weekly, price 10 cents, 114, Liberty Street, New York (obtainable in London at Hastings House, Norfolk Street, Strand). You are probably aware that all these publications can be consulted at the Patent Office, off Chancery Lane.

Colouring Cement Floors.

York.—Eboraceum writes: "Is there any preparation, other than Venetian red, for colouring cement floors, the material to be mixed with the other ingredients?"

No, there is no other pigment so suitable as red oxide of iron. Most metal oxide pigments are also suitable if permanent in themselves, though oxide of iron is the cheapest for yellow, brown or red.

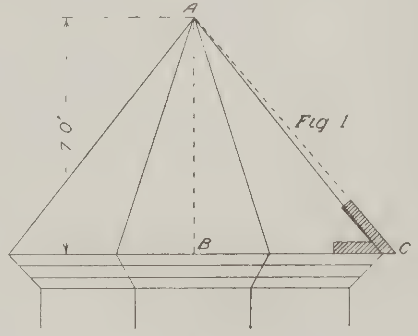
Competition for Garden City Cottages.

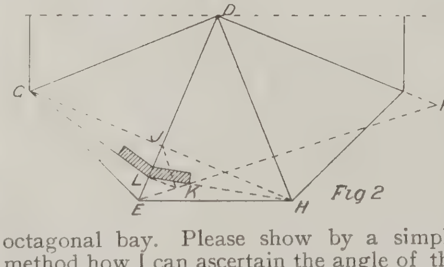
Lincoln.—S. P. D. writes: "Is the competition for cottages, &c., at Letchworth (the garden city) on a sound footing? I should like the opinion of an F.R.I.B.A."

We have not the conditions before us, and are therefore not in a position to express an opinion on the competition. However, the Competition Reform Society is supposed to look after these matters, and we always hear when a competition is regarded as unsatisfactory. In this case we have heard nothing, and therefore presume the conditions are satisfactory. Mr. W. V. Cooper, secretary of the Cheap Cottages Exhibition (347, Birkbeck Bank Chambers, Holborn, W.C.), states that the applications up to the present make the executive confident that the exhibition will be a success. Financial aid has been readily and generously given, and about £850 has been received, of which a large proportion has been allocated to the prize fund.

Bevels for Hip Tiles.

Herne Bay.—S. H. H. writes: "I send a rough sketch (re-drawn) of a roof over an octagonal bay. Please show by a simple method how I can ascertain the angle of the hips so as to have purpose-made hip tiles fixed for neat appearance."

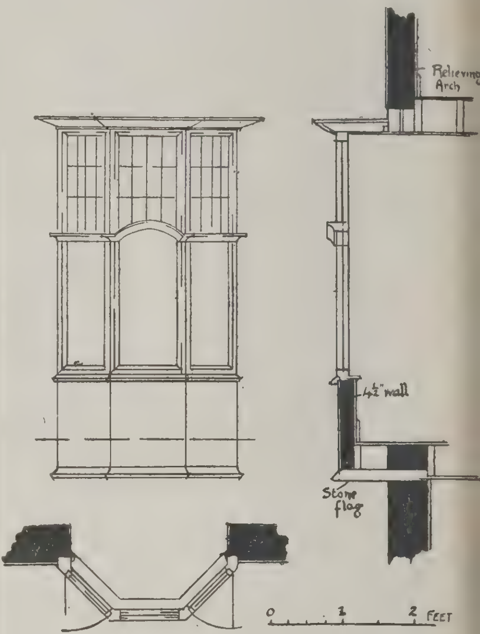




From the apex A in Fig. 1 drop a perpendicular to cut the line of eaves in B. From B take the horizontal distance BC = DE = length of hip rafter in plan (Fig. 2). Join CA, then BCA will be the true angle of the hip with the horizontal, or the pitch of the hip rafter. Now in Fig. 2 draw DF perpendicular to DE and equal to the height AB. In this instance it happens to coincide with another hip, but this is accidental. Join EF and GH, letting GH cut DE in J. From J drop a perpendicular on to EF, cutting it in point K, and from K drop a perpendicular on to DE, cutting it in point L. Join GL and HL. Then GLH will be the true angle between the roof planes meeting at DE, and therefore will give the backing to the hip rafters and the angle for the hip tiles. HENRY ADAMS.

Bay Windows to Houses.

A Northern Architect writes: "I have just finished a new building with a hanging wooden bay window, as per detail, and the local council has decided to summon me for this. The district surveyor says the plans were approved subject to the bay window being constructed of incombustible material. At the time the plans were passed I forwarded a letter stating that the bottom portion would be carried out in stone, with concrete over, but the window above would be constructed of wood and glass. The sanction of the council was conditional. The by-law in force is word for word the same as by-law No. 24 of the Local Government Model By-laws issued in 1877. I find this by-law is in use in a large number of other towns. At the same time, I know of no other town where wooden bay windows are not allowed. Is a window part of a structure of a wall, and if so, can local authorities pass plans conditionally, or must they either pass or reject them? I may say for your guidance that last year the same council permitted me to erect an exactly similar bay window, and took no action. They have also allowed a large amount of sham half-timber work to be fixed in front of gables, and windows to project beyond the outside line of the wall, and in a few instances have permitted wooden bay windows."



Though it is quite possible the urban district council are within the letter of their by-laws, there is little doubt that they are infringing the spirit in which it is intended that these should be administered. Personally I should defend such an action as they are now bringing against you, and think it very probable you will succeed. I regret that I have been unable to find a decided case upon the particular point to which you refer. F. S. I.

HIGH STEEL-FRAMED BUILDINGS IN BERLIN.

Government Refusal.

LAST year the Central Association of German Industrials addressed a memorial to the Government urging that the present building laws, which do not permit the construction in Berlin of dwellings or business buildings with a greater height than 22 meters (72·18ft.) from pavement to cornice, be so far relaxed as to allow steel-framed buildings of greater height to be erected, if not generally, at least in exceptional cases when good reason for such variation could be adduced.

The reasons for the proposed innovation as set forth in the memorial were that the rapid growth of Berlin in population and business interests required more room to be provided, particularly in the central districts, without increase of cost to tenants; that the restriction to a limit of four storeys compelled excessive lateral expansion that had already spread the city over an immense area, and thus lengthened the distance between the homes of many people and their work; and that experience in other countries had shown that high steel-framed buildings, when properly constructed, were safe, comfortable, uniformly better lighted and ventilated, and therefore more sanitary for dwellers and working people than those of ordinary height. Furthermore, it was urged that such a relaxation of building regulations would bring into use great quantities of structural steel and iron now largely produced in Germany, and for which an increased market would be highly appreciated by the steel and iron masters.

Thus plausibly stated, the appeal of the industrial association was submitted to the Ministers of Commerce, the Interior and Public Works, who, after due consideration, made a joint reply in which the petition was flatly refused for reasons which were stated at length but may be condensed as follows:—

(1) The Ministries are opposed to any system of buildings which will lead to an increase in the number of "renting barracks" (Miethscaserne), large buildings divided into a great number of small apartments or tenements, which are leased to families of working people, with the result that a great number of persons of both sexes and all ages are huddled together under conditions which are necessarily subversive of normal family life and prejudicial to public morals.

(2) Buildings so high as to be beyond the level of the present water supply could not be made clean and sanitary.

(3) Any important increase in height beyond the present limit would put the upper storeys of the buildings beyond the protection of the fire department as at present equipped and organized. Whatever might be the material interests involved, the Ministries held themselves bound to consider and protect not only the architectural unity and beauty of the city, but the health and the moral and physical safety of the people, all of which would, in their opinion, be compromised by the proposed innovation.

With this result the authors of the petition are by no means satisfied, and have replied that they had not proposed to carry buildings in Berlin to the excessive heights which are common in the United States, and that had the desired permission been granted it would have been provided by careful and competent engineering that all the requirements of fire protection, water supply and every sanitary necessity should be carefully and completely met. Moreover, in regard to resistance to conflagration, at Baltimore high steel-framed buildings, which offer least food for a fire, fully vindicated their superior safety and were left standing like monuments amid the wide waste of the ruins of four-and-five storey blocks built of stone and brick in the ordinary way.

Thus the discussion stands at present, and it does not appear likely that the Ministries, fortified as they are by considerations of municipal beauty and public health and safety, will recede from their position.

Law Cases.

Damage to House caused by "Tube" Railway.—In the King's Bench Division of the High Court of Justice on Friday the case of *Stockton and others* v. *The Great Northern and City Railway Co.* came before Mr. Justice Lawrance and a special jury. The case arose out of damage caused to 20, Highbury Crescent by the defendants' tube railway, which runs under a corner of the stables. The house was built in 1846, and an addition was made to it in 1865. The railway was made in 1900. Up to 1900 the claimants said there had been no appearance of movement in the house. When the tube was placed in position the defendants took away the lower part of the iron shell and substituted brick. Subsidence followed. At the end of 1901 cracks appeared in the house. In 1903 a cornice fell, and the billiard table had to be removed, as the floor was unequal. In January, 1904, the occupants were forced to leave the premises, as the back wall of the house was cracked from top to bottom and the house was unfit for habitation. The restoration of the house cost £1,111. Mr. G. F. Deacon, member of the Council of the Institution of Civil Engineers, attributed the movement to a displacement of the ground below, such as would occur in the construction of the tube, which could not have been put in without the clay being being left unsupported for a certain time. The settlement of the clay would extend to buildings at the side of the tube. The company had taken out the lower parts of the iron segments of the tube and substituted brickwork for them, which would create further subsidence. The pressure forcing the clay into the tube was 26 tons to the yard. Mr. Shiner, A.R.I.B.A., said he found the building out of plumb 1·87ins., and fallen away towards the tube. Counsel for the defendants said that in the strata in which this tunnel was driven there was no water, and no sand or pockets of soft material were met with. While the Greathead shield was in position, the tube was put in. Between the shield and the tube liquid cement was forced in under pressure. A segment of the tube was then taken out and had a foundation of grouting or liquid cement put in its place. It was said that the exposed end of the shield was without support and that movement could take place there. It had been found by experiment that that was not so. One thing was always to be remembered, subsidence only followed removal. If there was substituted for what was taken out an exact amount of substituted material, no subsidence would take place. The first thing seen in cases of subsidence was cracks in ill-built partition walls and piers. In this case the only portions of the premises over the tube had nothing wrong with them. The places that were affected were affected before the tube went there. Mr. Basil P. Everet, engineer in charge of the works during the construction of the line, said the tunnels were entirely in the London clay, and there was no water. They started grouting within two or three minutes of the shield going forward, and the cement would set within six minutes after the water was added. The cement was forced into the space by pneumatic pressure of 60 lbs. per sq. in. The cement in setting expanded into the crevices of the clay and compressed the clay. They found on inspection, when they opened up a part of the tube under Hornsey Fields, that there was 2ins. of grouting. The maximum surface without support at the face of the shield was 7ft. by 4ft. 6ins. The cutting edge of the shield, which was forced forward by pneumatic jacks, supported the clay. He had made tests, and there was no movement on the exposed surface of the clay. There was no difficulty in setting the brickwork at the bottom of the tube, and that showed there was no movement. Mr. Douglas Young, F.S.I., Mr. Gruning, F.R.I.B.A., Mr. Chatfeild Clarke, and Mr. Leslie Vigers, surveyors and architects, gave evidence for the defendants to prove that the house contained indications of old faults and cracks, and that the movement was due to the treacherous nature of the upper clay, and not to the tube, which was driven in the lower London clay. Other witnesses were called for the defendants to prove that the letting value of the houses in Highbury Crescent was diminishing. The jury returned a verdict for the claimants, with £2,000 damages.

Keystones.

A new Mortuary at Cardiff has been erected at a cost of £2,636 (site £1,500, building £1,136) in Trade Street, Penarth Road.

Aberdeen Society of Architects.—At the annual meeting held last week Mr. R. G. Wilson was elected president and Mr. John Rust vice-president.

Competition for Carnegie Library at Nelson.—Mr. G. H. Willoughby, F.R.I.B.A., of Manchester, has been appointed assessor in this competition, for which more than two hundred designs have been submitted.

Heraldic Glass.—At the recent annual meeting of the Exeter Diocesan Architectural and Archæological Society, Mr. F. Morris Drake read a paper on the heraldic glass in Ashton Church, which has been restored by him under the direction of Mr. C. E. Ponting, of Marlborough.

Manchester Infirmary Site.—The Royal Infirmary Special Committee of the Manchester Corporation has decided to prepare a report for presentation to the Council showing how the site of the infirmary could be utilized for the purposes of an art gallery and free reference library, and the City Architect has been instructed to prepare a block plan showing what portion of the site is available for building purposes.

A new Congregational Church is about to be erected at Seacombe, Cheshire, from designs by Messrs. Smith & Matley, architects, of 14, Ridgefield, Manchester. It will be faced with Ruabon bricks, with terracotta dressings, and the roofs will be covered with Westmorland green slates. The church will seat 650 and will have an octagonal tower with spire reaching to about 100ft. Messrs. Hughes & Stirling, of Bootle, are the contractors.

The Scottish Stonehenge.—Considerable interest is being taken in antiquarian circles in Scotland in a proposal to restore the Standing Stones of Stenness, often alluded to as the "Scottish Stonehenge." Mr. Cathcart Wason, M.P., suggests that if the proprietor, Colonel Balfour, were approached by the Society for the Preservation of Ancient Monuments he would afford every assistance in setting up the stones which have fallen and in making firm those which are likely to fall.

Northern Architectural Association.—The annual general meeting was held last week, when Mr. J. T. Cackett was elected president for the ensuing year and Mr. G. T. Brown vice-president. The annual report of the council stated the membership to be 221, which, excepting Manchester, was greater than that of any other allied society of the R.I.B.A. Finances were satisfactory, there being a balance of £129 to the good. Mr. A. W. S. Cross and Mr. G. Hubbard read papers on "Registration."

Preston Schools Competition.—Mr. F. W. Catterall has been appointed assessor in the competition for new schools at Preston, for which fifty-five sets of designs have been submitted.

An International Exhibition at Liege is to be held from April to October this year under the patronage of the Belgian Government. An International Housing Congress will be held in connection with it, and prizes are to be offered for a special competition in regard to the construction of workmen's dwellings, to be used as actual dwelling-houses after the exhibition has closed. The international committee for the organization of the congress is represented in this country by Mr. Henry R. Aldridge, 432, West Strand, W.C.

The Marine Drive at Scarborough, now being constructed around the foot of Castle Hill to connect the drives skirting the north and south bays, is proving a much more costly and difficult undertaking than was first anticipated by the Corporation, whose borrowing powers amount to £82,700. On Thursday last a Local Government Board enquiry was held, when an application was made to increase the borrowing powers by £25,000. The work was to have been finished in two years, but it has already occupied eight years, though it is now approaching completion.

A new Central Fire-brigade Station for Dublin is being built on a site at the corner of Great Brunswick Street and Tara Street, from designs by Mr. C. J. MacCarthy, the city architect. The corporation have entered into a contract for £17,000 with Mr. J. Donovan for the erection of the building, but the total cost is estimated at £25,000. Irish materials will be used as far as possible. The lower portion of the building, as well as the cornice and balustrade, will be of Irish limestone, and the walls of county Dublin bricks, faced externally with red bricks from Mr. Plunkett's works at Portmarnock. The roofs will be covered with Killaloe slates. Work on the foundations is now in progress, and the building will give employment to a large number of men for the next eighteen months or two years.

Architects' Benevolent Society.—At the fifty-fifth annual meeting held on Friday in the rooms of the Royal Institute of British Architects, Sir Aston Webb, R.A., made a special appeal for subscriptions, stating that not more than 5 per cent. of the architects practising in the United Kingdom contributed to the Society. Last year £950 was distributed among seventy-seven applicants for relief, and at the end of the year the accounts showed a deficit of £47. He feared that the benevolent work of the Society would be crippled this year unless there were a considerable addition to the number of annual subscribers. He had the pleasure to announce that Mr. William Glover, a past-president of the Northern Architectural Association, had that day presented the Society with £300, and further contributions of £25 each had been received from Mr. T. E. Collcutt, Mr. Edwin T. Hall and Mr. William Woodward, and to this list Sir Aston added his own name. As the majority of cases relieved by the Society come from the provinces, the Council note with much satisfaction that an appeal made in recent years to the allied societies has met with a sympathetic response. Last year the Leeds and Yorkshire Architectural Society (through their president, Mr. Bertram Bulmer) gave a donation of £10 10s. and added their name to the list of annual subscribers. To fill vacancies on the Council rendered vacant by the retirement of members in rotation, the following have been elected:—Col. Robert W. Edis, Mr. H. L. Florence, Mr. G. Bertram Bulmer, Mr. F. W. Hunt and Mr. Walter Spiers.

Views and Reviews.

Gas and Oil Engines.

As a cheap elementary book on gas and oil engines this is excellent. It is essentially practical in treatment and is illustrated by a number of diagrams clearly drawn and of a good size. There is, too, a very readable introductory chapter briefly tracing the development of the gas engine from its inception in the seventeenth century to the culminating Otto cycle. The author has aimed at furnishing just that information which is most needed by the user and the amateur builder of small power engines, and in place of a mere list of common engine troubles and their remedies he has given a full and clear explanation of the fundamental principles and essentials of good running. The contents of the book may be judged from the chapter headings, which are as follows:—The component parts of an engine; how a gas engine works; ignition devices; magneto ignition; governing; cams and valve settings; oil engines.

"Gas and Oil Engines simply explained," by Walter C. Runciman. London: Percival Marshall & Co., 26 29, Poppin's Court, Fleet Street, price 6d. nett.

A Sketch-Book.

We have received from the Manchester Society of Architects Parts I. and II. of their sketch-book, containing a number of lithographic reproductions of measured drawings and a few sketches. Mr. J. Harold Gibbons is the author of all the illustrations in Part I., these being of the principal drawings and sketches which gained for him the Pugin Studentship two years ago. They comprise plans and elevations of Chetham's Hospital, Manchester, Winchester Cathedral (including a good sketch of the tower and crossing from the north-east), a detail of the stone sedilia in Heckington Church, drawings of Leverington Church, sketches of Walpole Church (with a detail of the oak font cover) and a drawing of the tile pavement in Prior Crauden's Chapel in the Close at Ely. The drawings are carefully executed, but the reproductions of them are by no means faultless, there being innumerable weak and broken lines. The best of Mr. Gibbons's drawings is that of the sedilia at Heckington Church, Lincs. Part II. is similarly devoted to church work, with the exception of a drawing of a door and panelling in the ballroom at Haddon Hall. To this part Mr. Frank P. Oakley contributes some excellent measured drawings of oak screens in Manchester and Carlisle Cathedrals; Mr. Gerald S. Salomons drawings of Tideswell Church, Derbyshire; and Mr. R. Vernon, Mr. Joseph Holt and Mr. C. Paterson respectively drawings of the organ screen in Middleton Church, a screen in Cartmel Priory, and elevations and cross-sections of Whiston Church, Northants. Mr. Paterson is also the author of the Haddon Hall drawing mentioned above. The sketch-book is published by Messrs. Sherratt & Hughes, of London and Manchester.

The Best English Book on Reinforced Concrete.

This is undoubtedly the best book which has yet appeared on the subject in the English language. Reinforced concrete is rapidly coming to the front in this country, and such a work as Mr. Marsh's was greatly needed. Though there are excellent books in French, they are not convenient, nor would they be popular. After a general review of the subject, Mr. Marsh deals with the various systems employed, giving short descriptions of each system in alphabetical order, which is easy of reference; the third part is devoted to materials; Part IV. to practical construction, discussing the methods employed in the erection of reinforced concrete structures; Part V. to experimental research and data deduced therefrom; Part VI. to calculations; and Part VII. to illustrated descriptions of some structures which have been erected in reinforced concrete. There are also three appendices dealing respectively with M. Considère's test to destruction of the Pont d'Ivry, prevention of leakage in concrete structures containing liquids, and works constructed by Major Stokes-Roberts, R.E., in India. Mr. Marsh's arrangement is an admirable one, and allows the subject to develop naturally and clearly. The author limits the term "reinforced concrete" to the introduction of iron or steel sections into the substance of the concrete in such a manner and in such positions as to take up those stresses which cannot be resisted by the concrete unaided. In the author's opinion a joist surrounded by concrete is not reinforced concrete, but rather protected ironwork, as the joist bears all the stresses. A reinforcement employed in an unscientific manner greatly reduces the economy of this form of construction, as in such a case there will always be a waste of material and also a reduction, or rather no increase, in the elasticity of the concrete in tension. The part relating to calculations is elaborate and covers most forms of construction. It is concise and clearly written. The formulæ for slabs and beams, although giving somewhat smaller dimensions than those recommended by M. Christophe in "Le Beton Armé"—deservedly considered a standard work on the subject, and to which Mr. Marsh is chiefly indebted—are still well on the side of safety, and tables and diagrams are given with the object of saving the labour necessary in making the requisite calculations. The author adopts the theory for calculations based on the elasticity of the materials, although some constructors adopt empirical rules, and we may quote the following words from the book on the point: "To arrive at the true principles on which to base theories for obtaining the areas of the concrete and reinforcing sections many tests have been made and many theoretical formulæ have been established, but they have been carried into practice in very few instances, and consequently have seldom been subjected to the test of practical working. Although much has been done of late years by experiments, and mathematical reasoning based on the elastic properties of the materials, there are still some doubts to be cleared away and phenomena to be explained. Theory based on the elasticity of the materials, which is of necessity the true one, has not been used up to the present time by a great majority of the patentees or constructors of the several systems of reinforced concrete, nearly all of these using more or less empirical formulæ, and some no formula at all. The properties of the materials when combined are still under dispute, some engineers maintaining that the concrete, by having a reinforcement of iron or steel, obtains different properties than those it has when alone. The behaviour of reinforced concrete in works and in tests made to elucidate this point certainly seems to point in this direction, but there still remains a great deal of diversity of opinion upon this and other matters relating to the theoretical treatment of reinforced concrete." Although the author has dealt somewhat extensively with materials, this is the portion of the subject we think more attention should have been paid to; the chemistry of iron and steel is complicated, and that of cements almost equally so, while the nature of aggregates and water for mixing, and temperature, all have their bearing on the strength of the work, and much of the discrepancy that arises in experiments may be traced to neglect of proper study of this. The book is very fully illustrated with 512 views and diagrams.

"Reinforced Concrete," by Charles F. Marsh, A.M.I.C.E., A.M.I.M.E. London: Archibald Constable & Co., Ltd., 16, James Street, Haymarket, price 31s. 6d. nett.

DRAWING INSTRUMENTS.

WE are in receipt of two useful instruments manufactured by Mr. W. J. Brooks, namely, a parabola curve and a flexible curve. The former is accurately cut in transparent celluloid by specially designed appliances, and its axis, focus and latus rectum are engraved on it. It is of obvious utility as a set curve for draughtsmen, although primarily intended for students of the mathematics of the parabola. The curve is accurately constructed for use on squared paper, the unit being 1in. As to its use in geometrical conics, it will come in handy for drawing the curve $y = x^2$ (this graph can be used for reading off squares and square roots of numbers) and to solve an equation of form $x^2 - x - 1 = 0$. The flexible curves are made in three patterns: (A) a flexible strip of transparent celluloid or steel provided with tabs at intervals along its whole length, the curve being held in position up to the 8in. size by placing the fingers of one hand on the tabs, while the pen is used with the other, or, in the larger sizes, by securing the tabs by weights or drawing pins; (B) a self-clamping steel strip retained in any shape by means of a stiff-hinged linkwork attached to the tabs; and (C) a self-clamping steel strip specially designed for drawing long curves such as are required by ship- and boat-builders, made in sizes from 1ft. up to any length, the tabs in this type being held in position by light wooden cross-bars sliding through brass spring clamps and thereby held friction-tight against a long wooden bar running the length of the curve. These instruments are well made, and are deserving of adoption by draughtsmen having to settle problems for which they are designed.

Prof. D. A. Low's improved drawing appliances will appeal to almost every draughtsman, and we are happy to welcome them. Prof. Low is well-known for his books on geometry, &c., and he has done considerable service in devoting his attention to drawing instruments with such good results. His appliances comprise several designs of set-squares, adjustable protractor set-squares, tee-squares, protractors, scales, &c. These were introduced about a year ago, but the small stock was quickly exhausted, and the makers have since acquired greater experience and knowledge of their manufacture, the finish has been much improved, and the printing on the protractors and diagram measures has been made more indelible. The set-squares have bodies of a strong and tough white wood edged with transparent celluloid or with hard ebonized wood, as preferred. These are framed and faced with thin white polished celluloid. The celluloid facings give great strength to the squares, enabling them to be made much thinner than the framed set-squares which have been in use hitherto, and they are exceedingly light and convenient to handle; while the faces which come in contact with the paper, being smooth and white, any speck of ink or dust is at once seen and can be easily wiped or washed off. A special feature is that the thin celluloid facings leave off within about $\frac{1}{10}$th of an inch of the drawing edges of the square, so that when a square is resting on the drawing paper the drawing edges stand above the paper to the extent of $\frac{1}{100}$th of an inch. This slight elevation of the drawing edge above the paper does not interfere with accuracy in drawing, and it is found that in inking-in it reduces very considerably the chances of blotting or smearing. The tee-squares are made on the same principle as the set-squares, the edges being likewise in celluloid or ebonized wood, as preferred. A vector set-square is an immense aid in drawing stress diagrams. Professor Low's design consists of two arms at right angles to one another, and a movable arm hinged at the junction of the other arms. This arm can be turned and set at an angle at once. An adjustable protractor set-square to various designs and sizes is stated to be in preparation, consisting of a right-angled part and a segmental part working inside the angle, the circular edge of which has a tongue fitting in a corresponding groove on the angular part. The circular edge is graduated in degrees, so that the straight or drawing edge may be set at any angle from 0 degs. to 90 degs. A new form of protractor printed from an accurately engraved plate on thin white celluloid is very serviceable. The new cheap drawing scales printed on thin strips of wood are much superior to the usual kind on cardboard. An instrument for measuring the areas of irregular figures, and specially useful for determining the mean effective pressure from indicator diagrams from steam, gas and other engines, consisting of a piece of clear transparent celluloid, is also very useful.

Brooks's parabola curve, price 1s. Brook's patent flexible curves; prices: Pattern A, 4in. celluloid 9d., 8in. celluloid 1s. 6d.; steel: 16ins. 2s. 6d., 24ins. 3s. 3d., 32ins. 4s., 40ins. 4s. 9d., 42in. 5s. 6d., 56in. 6s. 3d.; Pattern B (steel) 9in. steel 3s., 18ins. steel 6s.; Pattern C (steel), 1ft. 4s. 6d., and 2s. 6d. each additional foot; (lancewood) 2ft. 12s. 6d., 3ft. 16s. 6d., 4ft. 21s. London: W. J. Brooks, 33, Fitzroy Square, W.

Prof. D. A. Low's improved drawing appliances. Set-squares 45 degs. 4ins. to 12ins.; 60 degs. 6ins. to 17ins., price 1s. to 4s. 6d. Tee-squares, 18ins. price 3s. 6d., 24ins. price 5s., 31ins. price 6s. 6d. Adjustable protractor set-square, 7ins. by 4½ins., price 2s. 6d. nett. Vector set-square, 7ins., price 1s. 9d. nett. Celluloid protractor, 3ins. radius, price 6d. nett; 4ins. radius, price 9d. nett. Sets of drawing scales 9ins. long, price 1s. nett; 12ins. long, price 1s. 6d. nett. Diagram measurer, price 1s. nett. London: Longmans, Green & Co., 39, Paternoster Row, E.C.

NORTHERN OUTFALL EXTENSION.

ON Saturday last the Northern Polytechnic Building Students' Association paid its first visit, to the northern outfall enlargement works extending from Old Ford to Plaistow. The students were conducted over the works by Mr. M. H. Marshall, one of the engineers, and were able to see the new sewers from the commencement of excavations in parts to the finished stage. Two new sewers of 9ft. internal height are being built (directly by the side of the old sewer), these being increased to four in number and decreased to 7ft. internal height at Stratford to pass under the Stratford Road, which does not allow sufficient head room for the larger sewers. The land in this district being of a very marshy nature, the foundations to the sewers are built in the form of a sunk concrete viaduct, the arches of which spring from concrete piers taken down to a hard bottom at a depth of 26ft. below the inverts. The sewers are horseshoe-shape with blue-brick inverts and are built in three rings, the bricks used internally being hard smooth facing bricks, and those externally wire-cuts. The concrete is composed of 8 parts ballast to 1 part best Portland cement, and it is interesting to note that over each gang of labourers mixing concrete there is an inspector. Where carried over roadways or over the River Lea the sewers are built up of cast-iron sections, supported between girders 10ft. deep.

The various difficulties that had to be contended with, and the methods adopted to overcome them, were pointed out by Mr. Marshall. In two places the sewers pass under railways—at Old Ford under the North London Railway and at Stratford under the Great Eastern Railway. At one place they are to pass over the London, Tilbury and Southend Railway, where a new bridge is to be erected in place of the present brick arches, and the old brick sewers are to be replaced by cast-iron sewers supported between the girders. In all cases the sewers have to be built without interfering with the traffic in any way, necessitating careful underpinning. For this purpose balks of timber are being prepared to support the rails during operations, those for the North London Railway, where the traffic is not very heavy, being 16in. by 16in. pitch-pine, while those for the Great Eastern Railway, where trains continually pass, weighing as much as 100 tons, are 24in. by 24in. oak balks. The work of underpinning will necessarily have to be done at night or on Sunday mornings, when traffic is somewhat quiet. This vast undertaking gives work to a great number of men, while there are in use about a dozen steam cranes and two locomotives. The whole of the work is being carried out by the London County Council at a cost of about £500,000.

BACTERIAL TREATMENT OF HOUSE DRAINAGE.

AT last Thursday's meeting of the Sheffield Society of Architects and Surveyors Mr. A. E. Turnell read a paper on "The Bacterial Treatment of House Drainage." He said it had long been known that the complex elements of which organic bodies were built were broken down and reduced by decomposition to their simpler forms, but it had only comparatively recently been realized that this change was brought about by the agency of the organisms present in these bodies, whose number and activity were increased by some alterations in the physical conditions by which they were surrounded. Sewage was an ideal nidus for bacteria, but it was a breeding place only, for as far as they were at present aware there was no such thing as spontaneous generation among these organisms, as they were all normally present in other spheres and under less favourable conditions before they were mixed up with or became part of the sewage. The satisfactory purification of small quantities of sewage was now an accomplished fact.

At the present time there were from 10 to 12 reorganized processes for the biological purification of sewage, which were only variations of the principle of cultivating the different species of bacteria present in the sewage itself. These processes were open and closed septic tank, with single and double contact beds, open and closed septic tank, followed by continuous filtration and single and double contact beds alone. The septic tank, or more properly speaking the cultivation tank, was the old cesspool slightly improved and dignified with a high-sounding name. This tank was the home of the anaërobes, which broke down, made soluble and liquified the organic compounds present in the sewage. The cultivation bed was the home of the aërobes, whose chief functions were those of oxidation and nitrification, and the solids in suspension in the sewage after treatment on this bed almost disappeared. A cultivation tank and bed could be built at very small cost, and sewage treated by this method might be turned on the land or into a stream without fear of further putrefaction or of causing a nuisance to adjoining estates.

Obituary.

Mr. Alexander Robertson, builder, of Newport, Dundee, died last week.

Mr. H. T. Neilson, quantity surveyor, of Darlington, died recently, aged 59.

Mr. G. Fowler Jones, F.R.I.B.A., of Malton, formerly of York, died on March 1st, aged 87.

Mr. S. J. Thacker, A.R.I.B.A., of Rottingdean and Totland Bay, died in London last week in his 73rd year.

Mr. T. D. Barry, architect, of Liverpool, was buried on Wednesday last. He retired about ten years ago, having been in practice since 1845.

THE ARCHITECTURAL ASSOCIATION.

Mr. Lanchester on Law Courts.

A MEETING of the Architectural Association was held on Friday evening at 18, Tufton Street, Westminster, the chair being occupied by the president, Mr. E. Guy Dawber, F.R.I.B.A.

The president announced the Committee's nominations for the House list for 1905-6 as follows:—*President:* E. Guy Dawber. *Vice-presidents:* John Murray and Louis Ambler. *Committee:* R. S. Balfour, Walter Cave, F. Dare Clapham, H. Gregory Collins, Alfred Cox, J. B. Fulton, Theodore Fyfe, J. S. Gibson, H. T. Hare, R. P. Jones, Arthur Keen, F. Lishman, Geoffry Lucas, Arnold Mitchell, H. Passmore, W. A. Pite, E. A. Rickards, J. MacLaren Ross, S. J. Tatchell, Maurice E. Webb, R. Douglas Wells, A. Needham Wilson.

Mr. H. V. Lanchester then read a paper on "Law Courts," illustrated by plans of the new Cardiff Town Hall and Law Courts, now approaching completion from designs by Messrs. Lanchester, Stewart & Rickards (illustrated in our issue for December 28th last). He said:—

When you kindly invited me to read this paper I selected law courts as the subject not so much in the hope of being able to contribute very much to the knowledge that most of you already possess, as because it seems to me that of the various problems in planning that the architect is called upon to solve this is one that involves the use of nearly all the expedients that are demanded, and is perhaps the most typical of the methods to be adopted in matters of arrangement, while at the same time there is considerable scope, in larger examples at all events, for the study of

Architectural Expression.

In this matter the Continental nations are noticeably our masters. Comparing most of our public buildings with those of equal importance abroad, while we find that at home they are too frequently pinched and ineffective, wedged into irregular sites between commercial premises, abroad we see a massive and imposing pile, its dignity enhanced by judicious isolation from all mean and unworthy surroundings, approached by a noble avenue or a spacious square. The rooms are lofty, the corridors wide, and everything is calculated to impress one with the importance of the building and its uses; but as far as ingenuity of arrangement goes, it is inferior to the cramped little concern familiar to us at home, and as regards the specific provision for its purpose, very little study seems to have been expended; in many cases an outline plan would hardly inform one whether the building was municipal, legal or residential in its intention, while few modern plans in our own country would fail to show at a glance whether they were for town hall, law court or palace. Lest we should feel inclined to congratulate ourselves unduly, it behoves us to consider whether we do not attach too much importance to our clever little schemes for specializing the routes and entrances in our designs, and whether the Englishman's mania for privacy is not carried beyond what is either essential or desirable. I certainly incline to this view myself, and think that we should occasionally make some concessions in minor points, if by such a course we can strengthen—if one may use the term—the dramatic force that a fine architectural treatment exercises. As an example of the importance attached abroad to worthily and suitably expressing the purpose of such a building, one need only cite the law courts of Brussels, where the intention of impressing the mind with the power and dignity of the law is so successfully fulfilled. The courts at Paris, though most interesting in themselves, are less suitable as an example, for, in spite of Dues's masterpiece, they represent, as a whole, a gradual aggregation which cannot be regarded in the same light as a completed study from one hand.

London Law Courts.

While far from desiring to detract from the design of our own courts of justice, combining as it does remarkable grace of detail with vigorous composition, it must be admitted by all that the internal arrangements fail, both from a practical and an architectural point of view, the chief defects being the divorce of the great hall from the courts and the consequent meanness of the approaches to the latter.

Manchester Assize Courts.

One of the most striking and typical examples of assize courts is that at Manchester, by Mr. Alfred Waterhouse, of which a plan is published in the "Transactions" of the Institute of June 12th, 1865. If you refer to this you will note the skill with which the somewhat complex problem is met, and, taking into consideration the fact that the public galleries are practically on the same floor as the courts, the satisfactory separation of the officials, bar and witnesses, with the consequent avoidance of awkward cross-currents.

You are doubtless familiar with the plan of the

Birmingham Courts,

which are universally considered to be most admirably arranged. In this case the large hall is in daily use, as it serves both police and assize courts; in fact, the latter are very much used throughout the year, and the large hall is a great convenience.

In the case of the

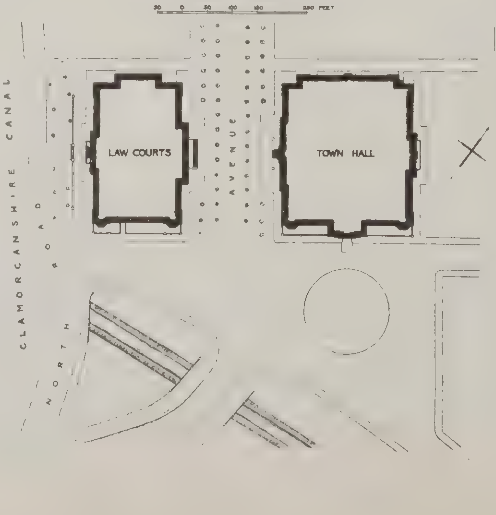
Old Bailey Courts

the site was a somewhat limited one for the accommodation required, and on this account the problem is treated in a simpler manner. As most of you have recently visited the building, it is hardly necessary to embark on a detailed description, and it may suffice to mention that the courts are grouped in two adjacent pairs, separated by the main staircase and lighting area; while a corridor in front serves witnesses and bar, and another behind the bench, the judges, and juries, the barristers' rooms are on an upper floor, and a suite at the south end of the building is provided for the Lord Mayor and City authorities.

Cardiff Law Courts.

Very fortunately for us, the site provided for our work at Cardiff is quite an exceptional one, and though not laid out with the skill that one sees exercised in France or Germany, it is nevertheless of a noble spaciousness and liberality, so that the buildings stand four-square, open on all sides, and the façades only broken by the surrounding trees. The design of the Cardiff courts was to a great extent governed by the relation of the building to the town hall on the east side, to which it corresponds in architectural detail and in its dimensions from north to south. This also suggested the arrangement of the assize courts and their adjuncts on an upper floor, though such a course is in this case justified on economic grounds alone.

CARDIFF MUNICIPAL BUILDINGS
BLOCK PLAN



The very general objection to placing the courts on the first floor is to some extent met by the arrangement of the steps, those not external forming, as it were, part of the design of the assize hall or *salle des pas perdus*.

You will, I trust, understand that in illustrating my paper by means of these plans, it is not with any idea of their representing a standard type; as a matter of fact, the conditions themselves preclude such a supposition; but that such a course makes it easier for me to formulate the various points with which I ought to deal.

With the plan before us, I should mention that the buildings include the following:—

The Assize Courts.
Police and Wreck Courts.
The A Division Police Station.
The Chief Constable's Offices.

Beyond pointing out on the plan the accommodation allotted to the two latter, I do not propose to refer to them, as they present but few variations from the usual practice. Basing our ideas on the examples quoted, it will be best to commence with the

Assize Courts,

and taking one of these and its surroundings in detail, the practical problems that I referred to at the commencement of this paper will become obvious.

We shall not then need to consider the lesser courts at the same length, as they will follow to a large extent the same principles. You have in those attending the court the following six main divisions:—1, judge; 2, jury; 3, bar; 4, witnesses, solicitors (and litigants in civil cases); 5, prisoner and police; 6, public—each of which it is desirable to keep to some degree distinct, while the first two must be able to pass direct to their retiring-rooms without emerging into any of the general corridors.

You will see at once that it is practically impossible to secure this degree of sub-division on one floor, but the removal of the public to an upper gallery and the provision of steps from the dock to a lower floor for the prisoner simplify things very much.

A corridor in front of the court will serve division 4, and also jurors in waiting and when discharged. Corridors on one or both sides will provide for the bar and officials, while the judge enters (through his private room) from suitable access provided at the back of the bench. Thus we may mentally picture as the ideal arrangement a central block consisting of the court plus the judge's and jury's retiring-rooms, surrounded by a corridor, outside which are suitably placed the various rooms for officials, bar, witnesses, &c. Taking this as a starting-point, it will almost inevitably occur that exigencies of lighting, access, &c., will demand modifications; for instance, the courts may require to be grouped, as at Birmingham and the Old Bailey; the site may be too small to allow of all the rooms on one level, as at the High Courts; or, again, the lighting of a lower floor may have to be considered, as is the case in our building at Cardiff. At the High Courts of Justice the officials' and barristers' rooms are very ingeniously dealt with on a mezzanine below the judges' rooms, &c., at the back of the bench; the bench being raised, these rooms are conveniently near the level of the court. On the other hand, the jurors' retiring-rooms are not well managed, being in the basement, two floors below the court level. The witnesses' rooms are next in importance, and if it is difficult to place those in close proximity to the courts, an enclosed space may be provided at the back of the court for witnesse immediately wanted, though I think the more usual provision of a few seats in the court and a good room close at hand preferable.

The Grand Jury,

an important factor in the conduct of our assizes, need not be in such close touch with the court, as it only assembles there at the commencement of the session to receive the judge's charge, and then withdraws to deal in a preliminary way with the cases. It hears sufficient evidence to decide whether a case should proceed or not, and its communications are handed in to the clerk in the form of a "true bill" or otherwise.

The grand jury, twenty-four in number, is drawn from the magistracy and more important residents in the circuit.

It is a general practice to put its rooms on an upper floor with an opening into the court by which the bills can be delivered on the usual "fishing-rod." The arrangement of our building enabled us to put a gallery in the court which would accommodate the grand jury while being charged, but it is very possible that judges will prefer to have them in the body of the court instead.

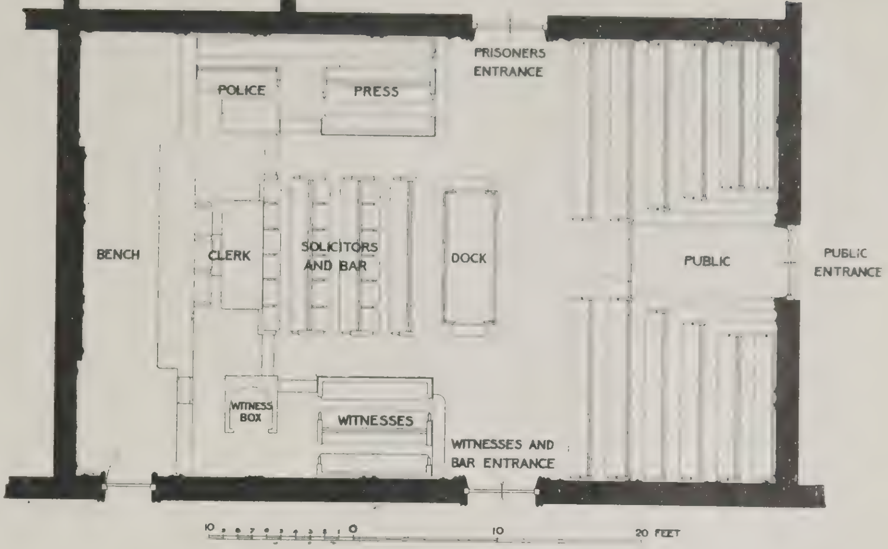
Before going into the arrangements of the courts themselves it is worth while to run through a short schedule of those for whom accommodation must be provided.

(Schedule below.)

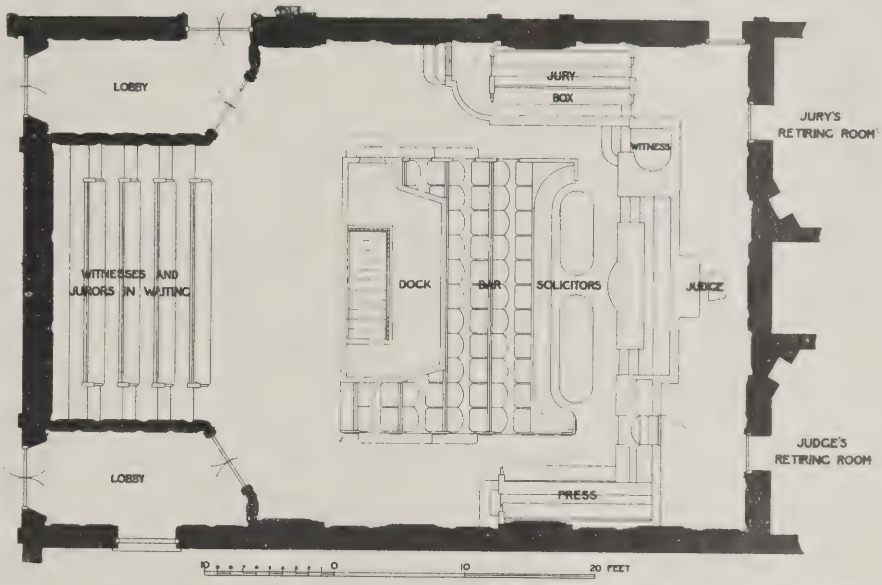
Details of Court-room.

We now come to the details of the court-room itself. Taking assize courts first, we find that the usual form of court is now a short oblong with a width of 30ft. to 40ft. and a length of 40ft. to 60ft., but at Gloucester the courts (erected some sixty years back) are semicircular in form, with the seating in concentric semicircles struck from the judge's throne; this arrangement seems a good one, both practically and architecturally, and might, I should imagine, be more frequently employed where the site is suitable. We will assume, however, that the rectangular plan is adopted. After arranging for the bench, which should be about 25ft. long by 6ft. or 7ft. in width, and raised 2ft. 6ins to 3ft. above the floor of the court, the chief point on which any difficulty arises is the position of the witness-box; this should not be less than 10ft. or more than 12ft. from the judge, and should again be within

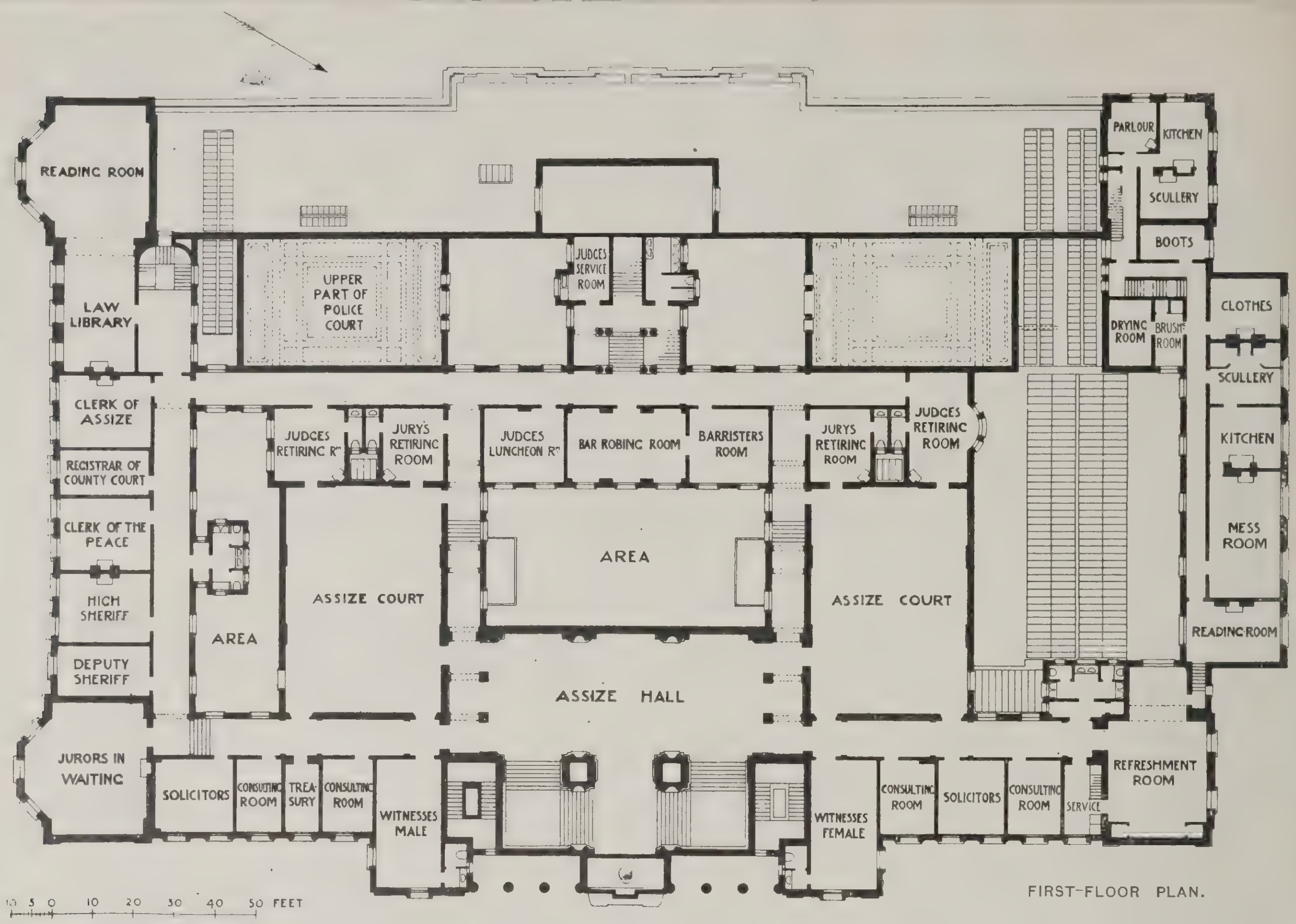
PLAN OF POLICE COURT CARDIFF



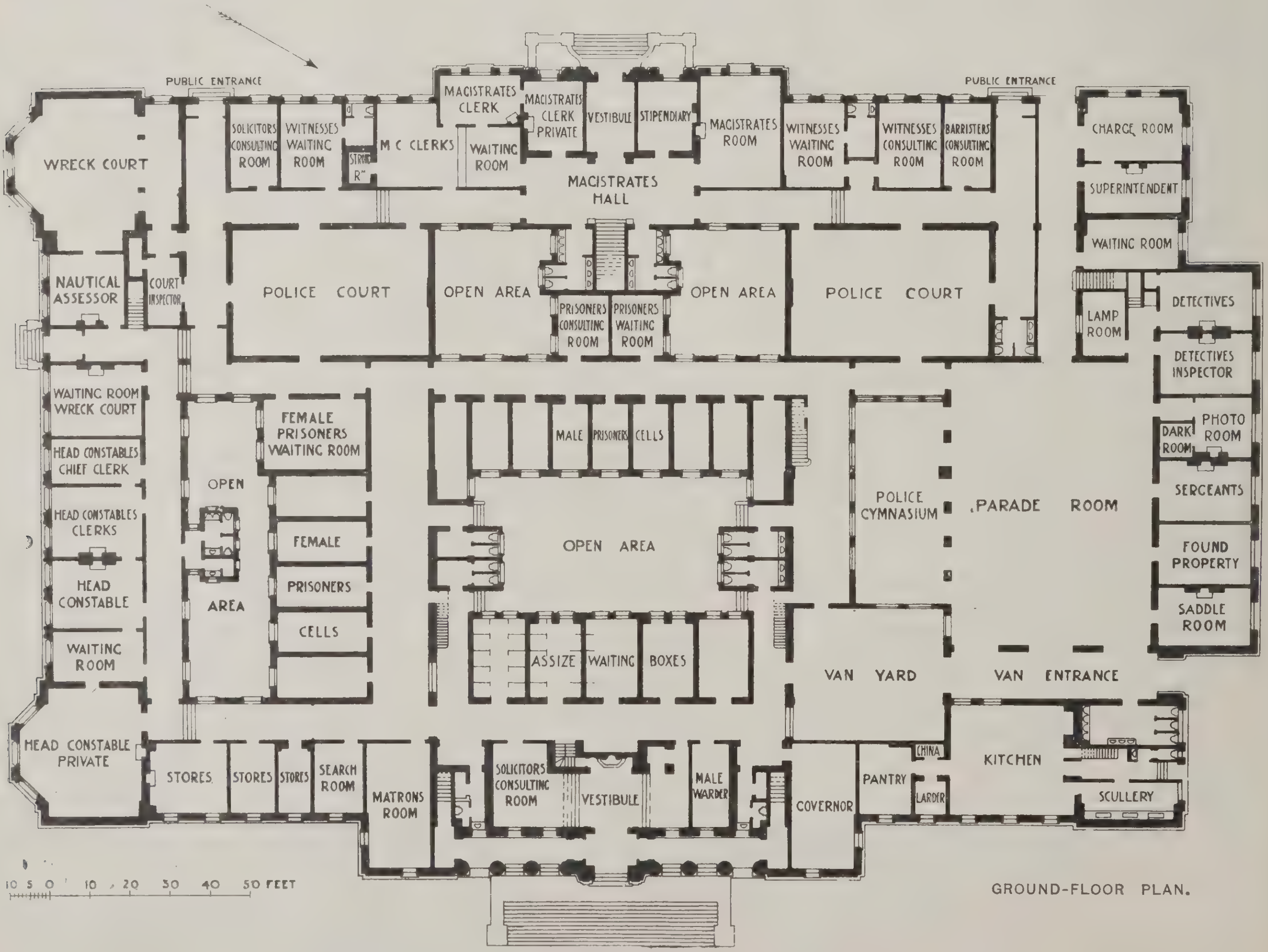
PLAN OF ASSIZE COURT CARDIFF



(1) Assize Court. (Criminal.)	Sheriff. Deputy Sheriff. Judge. Judge's Marshal. ,, Clerk. Assistant Clerk.	Jury of Twelve. Jurors in waiting.	Bar.	Witnesses and Solicitors. Ushers. Official Reporter. Press.	Prisoners. Warders. Police.	Public.
(2) Assize Court. (Civil.)	As above.	As above.	,,	As above and Litigants.	None.	,,
(3) Quarter Sessions. (Appeals from police and petty sessions in minor cases; licensing cases.)	Magistrates with Chairman of Bench or a Recorder Clerk.	None.	,,	Applicants. Witnesses and Solicitors.	Prisoners and Police.	,,
(4) Petty Sessions. (Country police court.)	Magistrates or Stipendiary Clerk.	None.	,,	Prosecutors. Witnesses and Solicitors. Press.	Prisoners and Police.	,,
(5) Police Court.	Magistrates or Stipendiary Clerk.	None.	,,	Prosecutors. Witnesses and Solicitors. Press.	Prisoners and Police.	,,
(6) Wreck Court.	Stipendiary. Nautical Assessor. Clerk.	None.	,,	Ship's Officers. Witnesses and Solicitors. Press.	None.	,,
(7) Sheriff's Court. (Compensation cases and assessment of damages.)	Deputy Sheriff. Clerk.	Jury of Twelve.	,,	Plaintiff and Defendant. Witnesses and Solicitors.	,,	,,
(8) County Court.	Judge. Registrar. Clerk.	Jury of Five.	,,	Plaintiff and Defendant. Witnesses and Solicitors.	,,	,,
(9) Coroner's Court.	Coroner.	Jury of Twelve.	,, (Occasionally).	Witnesses.	Occasionally prisoner under escort.	,,



FIRST-FLOOR PLAN.



GROUND-FLOOR PLAN.

LAW COURTS, CARDIFF. LANCHESTER, STEWART AND RICKARDS, ARCHITECTS.

12ft. or 14ft. of the examining barrister and the jury. If much further than this the witnesses' replies may not carry, and the facial expression, which is sometimes important, may escape observation. It is more usual to put the witness on the other side of the judge to that occupied by the jury, with the advantage that the witness practically faces the jury-box when under examination, but with the disadvantage that remarks audible to the barrister and judge may not reach the jury, who are generally less inclined to interpose in asking the witness to speak up. After consulting authorities of great experience, we decided to place the witness-box on the jury side, pushing the latter slightly further down the court than usual, so that they get at least a profile view of the witness. The witness-box should be 2ft. above the floor, and should have a small table-top for documents or other articles produced in evidence. In front of the bench, and about a foot below it, are seats for the judge's clerk and officials assisting him, and in front of these on the floor of the court the tables and seats of solicitors, while on the opposite side to the jury-box are placed the official shorthand writer and the Press. Behind the solicitors sit the barristers, and behind them is the dock. In the court where civil cases are heard this dock is convertible into additional seats for the bar, or for special witnesses, experts, &c., while the back of the court provides for witnesses and jurors-in-waiting.

Police Courts

follow much the same general arrangement, with the exception that no jury-box is required, while the cases are usually disposed of much more rapidly. The public may either be in an upper gallery or on raised staging at the back of the court. The prisoners are usually brought into the dock by means of a staircase from below, but at Cardiff they come in on the level from the cells corridor, which runs along the side of the courts; to our mind this is the more expeditious method. You will see that in our building these courts are approached from three sides, and that the grouping of the two avoids cross lines of traffic as far as possible in such a case.

The Wreck Court

is presided over by the stipendiary and a nautical assessor, and deals with such cases as its name implies, those attending being chiefly engaged in the mercantile marine.

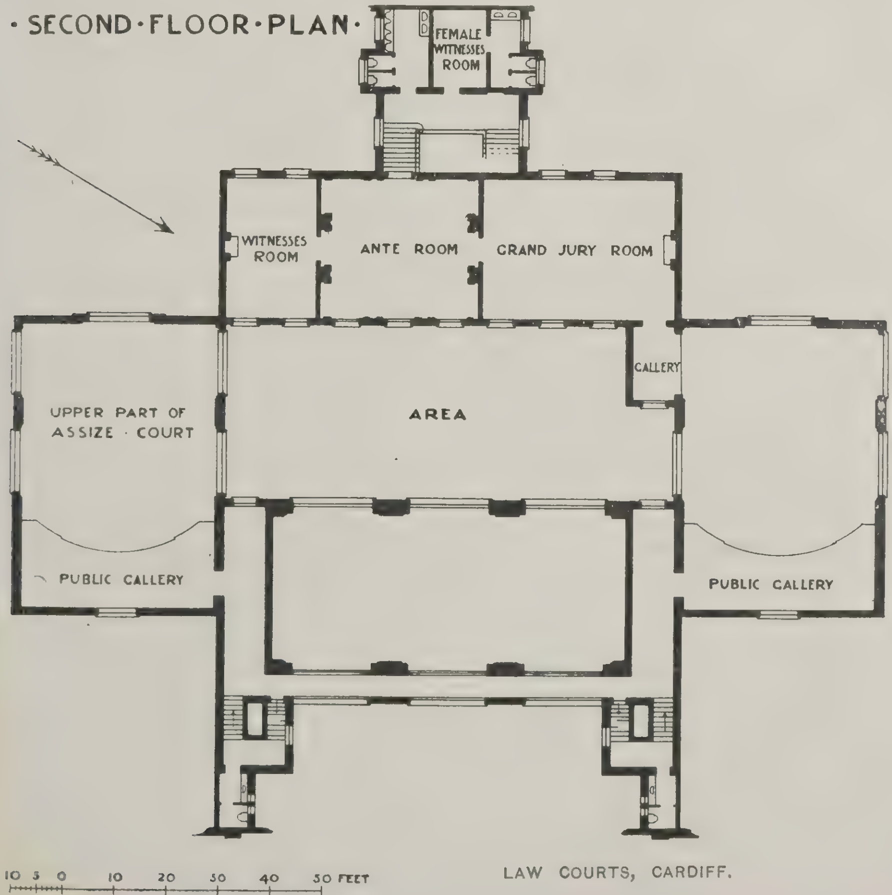
Heating.

The buildings are heated by the atmospheric steam system, the steam being slightly below atmospheric pressure; the boilers are in the basement of the town hall, and pipes are brought through a subway connecting the two blocks; the courts and other rooms are supplied with fresh filtered air driven by electric fans through steam-heating batteries, and carried by means of ducts and flues to suitable points. Extraction flues and ducts are carried to blowers in the two towers. It may interest you to hear, what I only knew myself a few days ago, that this is practically the same system as was adopted in the court rooms at Manchester over forty years ago; though, of course, many variations in detail have developed in the meantime. At all events, experience has proved that for rooms as much occupied as courts some form of mechanical ventilation is essential.

You have, I imagine, formed a fair general idea of the requirements in buildings of the class under consideration, and not wishing to extend these remarks unduly, I propose only to refer briefly to the general character which might be expressed architecturally in law courts.

Treatment.

A certain austerity should, without doubt, be the prevailing note, but this should be most emphasized in the justice chamber itself, where the presence of ornament and useless accessories would be distinctly out of place. The assize hall, however, presents an opportunity which is scarcely to be found in any other description of building Severe in treatment though it should be, it is yet a link between the outer world and the solemnity of the tribunal; as it leads to the various departments, and has to provide for the freest perambulation, it includes more than one vista, and affords scope for the romantic treatment associated with an exchange or public loggia where the learned might exercise the imagination and find inspiration in a sense of space and rhythmic form such as a well-designed apartment of this importance and character should suggest.



LAW COURTS, CARDIFF.

A feeling of the open air, quite apart from the matter of ventilation, should be imparted. Any sense of confinement would effectually mar the relief which such a hall affords to those who have felt the tension of a hardly-fought case. Balconies to the open air, provided their outlook is not too exciting, would be valuable as adjuncts, and mysteries of light and shade might be sought for.

A considerable uniformity of material would seem to be desirable, such as could be secured by a vaulted room in stone with a stone floor tempered by the introduction of other materials, if they are used only in the broadest way

Such a hall offers great opportunities of an almost purely architectural character, and the use of ornament and sculpture need not be excluded, though these adjuncts are capable of a freer treatment in the exterior of the building. It may be remembered that a "palais de justice" is not a prison, and that in the hands of an artist dignity and balance may achieve a result typifying the magnificence of the law, which is no terror to those who have no reason to fear it; and a palace of justice as a monument to a merciful institution might well have some elements of gaiety in its composition.

A short discussion followed in which Mr. Francis Hooper, Mr. E. A. Rickards, Mr. Baxter Greig and Mr. Dawber took part.

The president announced that the next meeting would be held on March 24th, when Mr. A. Needham Wilson would read a paper on "Sketch Plans and Working Drawings."

The students' smoking concert, which is being organized by some members of the Association, and at which it is hoped that many art students from the Academy, Slade and other schools will be present, is to be held at the Monico, Piccadilly Circus, on Tuesday, March 28th, at 9 p.m. (morning dress). Tickets 2s. 6d.

R.I.B.A.

THE following have been elected Fellows and Associates of the Royal Institute of British Architects:—

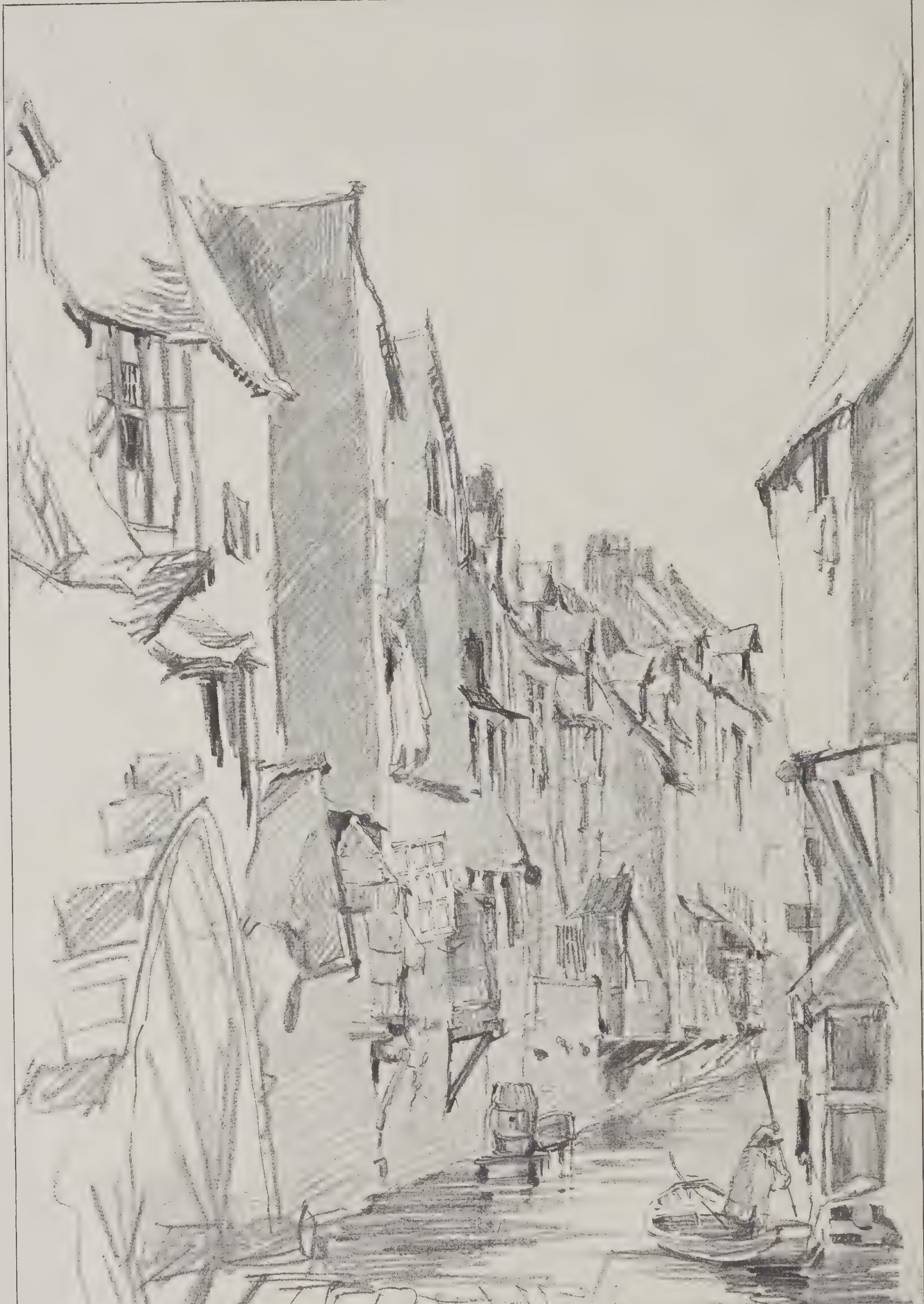
Fellows.

F. E. Fellows Bailey (Walsall)
H. Bailey
W. Bevan (Pretoria)
C. B. Bone
J. Campbell (Wellington, N.Z.)
W. E. V. Crompton
C. B. Flockton (Sheffield)
J. F. Groves (Newport)
A. J. Hardwick (Kingston-on-Thames)
A. G. Leighton
H. H. McConnal (Walsall)
T. Moore
A. Neill (Leeds)
E. T. Powell
W. G. Wilson
E. W. Wimperis

Associates.

T. F. Amery
D. Anderson
E. G. Goodson Bax
W. S. Beaumont (Manchester)
M. S. Briggs
J. S. Brocklesby
C. Fry Callow
C. P. Carter (Mansfield)
G. R. Ellis (Manchester)
J. A. Fletcher (Leicester)
H. C. Fread
W. J. Freeman (Halifax)
C. L. Gill
H. H. Golding
P. A. Hinchliffe (Barnsley)
P. A. Horrocks
A. B. Hubback (Kuala Lumpur, Selangor)
D. B. Jenkinson
G. A. Johnson
J. Miller (Sheffield)
C. Nicholas
H. L. North (Conway)
C. Paterson (Bowdon)
A. R. Powys (Montacute)
E. Quiggin (Liverpool)
G. S. Salomons (Manchester)
H. R. G. Strong Smallman
N. C. Smith (Moffat)
E. G. W. Souster (Northampton)
C. J. Thompson
J. N. Randall Vining

Reinforced Glass Steps are made by the Glass Co. of Saint Gobian, France. They are formed with glass slabs, and are said to be fire-resisting, durable, not at all slippery, and capable of sustaining heavy weights. They are made up to 10ft. in length and have a wire skeleton embedded in the centre.



A CONTINENTAL SKETCH BY THE LATE J. BURGESS, OF LEAMINGTON.

Builders' Notes.

London Master-Builders' Association. — Mr. Frederick Higgs has been elected president for the current year.

South Wales Master-Builders. — The quarterly meeting of the South Wales Master-Builders' Federation was held at Cardiff last week, when the scheme of a conciliation board was approved.

Royal Institute of Public Health.—In connection with the London Congress to be held in the Regent Street Polytechnic from July 19th to 25th there will be an exhibition of educational, sanitary and hygienic appliances.

The Columbian Fireproofing Co., Ltd., of 37, King William Street, London, E.C., has secured the contract for floors and roofs at the new elementary schools at Kingston-on-Thames; also the steelwork and floors in the new power-house for Messrs. Tate & Sons, sugar refiners, at Silvertown.

A neat Insurance Diary and Pocket Book, with four pages of information concerning the Blount door-check, has been published by Messrs. Charles Winn & Co., of St. Thomas Works, Granville Street, Birmingham, who will be pleased to post a copy to anyone in the trade. We are glad to see that the firm's name has not been splashed all over the book, but that Messrs. Winn & Co. have published it in a modest form. The pages of squared paper will be found very useful.

A new Thames Wharf.—At last week's meeting of the Thames Conservancy an important scheme was agreed to for the erection of a new quay about six miles above Gravesend. The quay will be about 6,600ft. long and 58ft. wide, and on the landward side of it will be 10 transport sheds, each 300ft. long and 61ft. wide. The work is to be commenced within twelve months from the date of the granting of the Thames Conservancy licence, and will extend over two years. The estimated cost is £1,000,000.

A Massive Crane Gantry is nearing completion at Messrs. Harland & Wolff's shipbuilding yard, Belfast. It is 190ft. high, 650ft. long, 18ft. at the base, and weighs nearly 6,000 tons. At the summit is a rapid-running cantilever crane 230ft in length. The cranes on either side of the cantilever run on a projecting railway, and each is capable of lifting 10 tons when at full out-outreach, or 20 tons when extended 70ft. Three-phase current for the crane is supplied by 12 motors with a gross capacity of more than 400-h.p. The cost of the structure will be £80,000, of which £12,000 has been expended on the foundations alone, a large amount of piling and some thousands of tons of concrete having been necessary.

Aberdeen Painters' Strike.—A conference between the operative painters on strike in Aberdeen and the masters' association took place last week. Numerous points were settled amicably until the issue was narrowed down to the by-laws dealing with the date of the signature of the working rules and the question of the employment of labourers to do work which, the operatives contended, should be done by painters. The keenest discussion took place over the first point raised by the men—"that employers notify any proposed change in the by-laws by March 1st every year." The masters contended, in the first instance, that the date of signature should be January 1st in each year, but were prepared after discussion to make the date February 1st. The operatives, however, clung to their point, and the result was a deadlock so far as the date of signature was concerned. The second question on which there was considerable difference of opinion was the demand by the men "that labourers shall not be employed by any employer in doing painting, glazing or papering work." The employers were willing to give way on the point as to the employment of labourers for painting, but not in the matter of glazing and papering work. The men insisted on the adoption of the whole by-law as they had presented it. On this point, as on the former, the parties could not agree, and the final result of the conference was that while both parties were at one on most of the points raised, they could not agree on the two mentioned — the date of signing the by-laws and the question of the employment of labourers.

Correspondence.

Cottages with Bathrooms.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—In reply to 'J. H.,' I am well aware that the connection of bath to copper in a similar way to mine has been done, but I have never heard of a bathroom on the ground floor before. The advantage I claim for my plan is the privacy of a separate room, with hot and cold water, giving the maximum of convenience with the minimum of trouble. Almost all cottages in this district have two rooms beside the kitchen, so there is no drawback in connection with the copper and sink.—Yours truly,

IPSWICH. W. H. DEATH.

English v. Foreign Granite.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Permit me to contradict Sir John Jackson's statement, made at a recent Exeter arbitration, that British granite masons are less reliable than foreign ones. In your issue for last week, as well as in numerous other contemporary papers, Sir John Jackson is reported to have said: "Englishmen go off drinking so often. The Norwegian takes a fortnight about once a year, drinks for a fortnight and has done with it." I have visited granite quarries in Norway and Sweden on several occasions, and have nothing to say against their operatives. But as an employer of granite masons in my own yard for nearly forty years, I never knew one go off on "the booze" for a week together, let alone for a fortnight. As a class, granite masons—whose work is certainly more laborious and demands greater muscular energy than does any other branch in the building trades—are steady men. I have those in my employ who, save during the usual public holidays, have not lost a day—nor half a day—during the last ten years. The British granite mason is, as a rule, an exceptionably steady workman. Sir John only knows what he is told. I speak of what I see directly under my own nose.—Yours truly, HARRY HEMS.

EXETER.

[Speaking at Penryn last week Mr. Douglas Hall, prospective Conservative candidate, said the cost of British granite was not more than 3d. per foot, or 3s. 6d. a ton, in advance of foreign granite, and the reason why foreign granite was brought into this country at a cheaper rate was because the foreigners worked longer hours, were satisfied with a less standard of comfort, and laboured under conditions which Englishmen would not care to submit to. Another thing was that in Norway and other places the fair-wage clause was utterly inoperative, and for that reason he could not understand that foreign granite should be admitted in Government contracts. He was told by people who knew that on every £1,000 granite contract £666 went in wages to the working men—more than on almost any other manufactured article. For that reason he maintained in general that there ought to be a heavy protective duty on granite.]

Current Market Prices.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	8	0	1	10	0
Clover, best	per load	3	15	0	4	2	6
Hay, good	do.	3	10	0	3	15	0
Sainfoin mixture ...	do.	3	10	0	3	17	6
Straw	do.	1	12	0	2	0	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ...	per cwt.	1	0	5		—	
Colza Oil, English ...	do.	1	3	0		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0		—	
Linseed Oil, barrels ...	per cwt.	0	16	6		—	
Petroleum, American ...	per gal.	0	0	$5\frac{1}{8}$	0	0	5
Do. Russian ...	do.	0	0	$4\frac{3}{4}$		—	
Pitch	per barrel	0	8	0		—	
Shellac, orange	per cwt.	7	5	0	7	10	0
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	4	0		—	
Tar, Stockholm	per barrel	1	6	6		—	
Turpentine	per cwt.	1	18	$1\frac{1}{2}$		—	

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ...	per ton	80	0	0		—	
Iron, Staffs., bar ...	do.	5	17	6	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	2	6	10	5	0
Lead, pig, Soft Foreign...	do.	12	5	0		—	
Do. do. English common brands	do.	12	11	3		—	
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14	0	0		—	
Do. pipe	do.	15	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	5	0		—	
Do. floor brads... ...	do.	9	0	0		—	
Steel, Staffs., Girders and Angles	do.	5	5	0	6	0	0
Do. do. Mild bars ...	do.	6	0	0	6	5	0
Tin, Foreign	do	134	10	0	135	0	0
Do. English ingots ...	do.	134	10	0	136	0	0
Zinc, sheets, Silesian ...	do.	28	0	0		—	
Do. do. Vielle Montaigne	do.	29	0	0		—	
Do. Spelter	do.	24	5	0	24	7	6

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Whitewood, American, logs.	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	3	0
Fir, Dantzic and Memel	per load	2	7	6	4	15	0
Pine, Quebec, Yellow ...	do.	4	5	0	7	5	0
Do. Pitch, American...	do.	2	8	0	5	15	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, Galatz, White, 1st and 2nd, 3×11	per std.	7	10	0		—	
Do. Archangel, White, 2nd, 3×11	do.	9	5	0	9	15	0
Do. do. do. do. 3×9	do.	9	5	0		—	
Do. do. Yellow, 3rd, 3×9	do.	11	10	0		—	
Do. do. do. 4th, 3×9	do.	9	0	0		—	
Do. Mesane, Yellow, 3rd, 3×9	do.	11	10	0		—	
Do. Kovda, Yellow, 4th, 3×9	do.	9	5	0		—	
Do. Sundswall, Yellow Unsorted, 3×9	do.	11	0	0		—	
Do. Nederkalix, Yellow, 2nd, 3×8	do.	8	15	0		—	
Do. do. do. do. 3×7	do.	8	15	0		—	
Do. Gefle, Yellow, Mixed, 3×7	do.	10	10	0		—	
Do. do. do. do. 2½×7	do.	10	10	0		—	
Do. Uleaborg, Yellow, Unsorted, 2½×9	do.	8	10	0		—	
Do. Ingramport, Yellow, Unsorted, 2½×7	do.	7	15	0		—	
Do. Amherst, N.S., Spruce, Unsorted, 3×7	do.	7	5	0		—	
Do. Quebec, Spruce, 3rd, 3×12	do.	8	5	0	8	10	0
Do. do. Yellow, Pine, 1st, 3×11	do.	22	15	0	23	0	0
Do. do. Red Pine, Unsorted, 3×8	do.	8	0	0		—	
Do. do. do. do. 3×7	do.	7	10	0		—	
Do. English Bay Spruce, Unsorted, 3×9...	do.	8	5	0	8	10	0
Do. Montreal, Yellow Pine, 3rd, 3×11	do.	9	0	0		—	
Do. do. Spruce, 2nd, 3×9	do.	8	15	0	9	10	0
Battens, all kinds ...	do.	6	5	0	13	10	0
Flooring Boards 1in. prepared, 1st... ...	per square	0	9	0	0	10	9
Do. 2nd	do.	0	8	9	0	10	0
Do. 3rd, &c.	do.	0	7	9	0	9	6

HARD WOODS.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	4	0	0	7	10	0
Birch, New Brunswick...	do.	2	10	0	5	5	0
Do. Quebec do. ...	do.	2	10	0	6	0	0
Box, Turkey	per ton	7	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	$3\frac{1}{2}$		—	
Do. Honduras ...	do.	0	0	$3\frac{1}{2}$		—	
Do. Tobasco	do.	0	0	$5\frac{3}{32}$		—	
Elm, Quebec	per load	4	2	6	8	15	0
Jarrah, planks	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras...	per ft. sup.	0	0	$4\frac{11}{16}$		—	
Do. African ...	do.	0	0	$2\frac{5}{32}$		—	
Do. St. Domingo	do.	0	0	4		—	
Do. Cuba ...	do.	0	0	$4\frac{5}{8}$		—	
Do. Lagos ...	do.	0	0	4		—	
Do. Benin ...	do.	0	0	$2\frac{21}{32}$		—	
Do. Tobasco ...	do.	0	0	$4\frac{31}{32}$		—	

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
March 16	Douglas—Alteration, &c., to Board School	School Board	G. & W. R. Kay, 22 Athol Street, Douglas.
,, 16	Dundalk—House	Mr. C. J. M'Gahon	J. F. M'Gahon, Roden Place, Dundalk.
,, 16	Gloucester—Alterations, &c., to Buildings	Corporation	City Surveyor's Office, Guildhall, Gloucester.
,, 16	Lancaster—Shed	Tramways Committee	Tramway Engineer's Office, Electricity Works, Marton St., Lancaster.
,, 16	Pontefract—Three Shops	Co-operative Industrial Society	Garside & Pennington, Pontefract.
,, 16	Tredegar, Mon.—Twenty-two Cottages	Inkerman Lodge Building Club	J. Gabriel, 1 Park Place, Tredegar.
,, 17	Portree, Isle of Skye—Naval Reserve Buildings	———	Superintending Engineer, H.M. Naval Establishment, Rosyth, Inverkeithing.
,, 18	Bury St. Edmunds—School	W. Suffolk Education Committee	Committee's Offices, 5 Crown Street, Bury St. Edmunds.
,, 18	Wortley, near Sheffield—Widening Bridge	County Council	County Surveyor, County Hall, Wakefield.
,, 18	Barkisland, near Halifax—Rebuilding Bridge	County Council	County Surveyor, County Hall, Wakefield.
,, 18	Beaufort, Wales—Parish Hall	Rev. D. J. Llewelyn	Henry Waters, Architect, Beaufort.
,, 18	Chester-le-Street, Durham—House, &c.	Water Co.	Water Co.'s Office, Front Street, Chester-le-Street.
,, 18	Longpreston, Clitheroe—Warehouse	Mr. J. Jackman	E. T. Welch, 10 York Street, Clitheroe.
,, 18	Nelson, Lancs—Club Premises	Balfour Constitutional Club	A. O. Evans, Williams & Evans, Pontypridd.
,, 18	Porthcawl—Bungalow	Mr. T. D. Bevan	G. F. Lambert & Son, Architects, Bridgend.
,, 20	Birmingham—Alterations to Female Epileptic Block	Guardians	W. H. Ward, Paradise Street, Birmingham.
,, 20	Birmingham—Fire-station	Watch Committee	John Price, Council House, Birmingham.
,, 20	Carlisle—Caretaker's Lodge	Education Committee	H. C. Marks, 36 Fisher Street, Carlisle.
,, 20	Beckenham—Two Cottages	Urban District Council	J. A. Angell, Town Hall, Beckenham.
,, 20	Birkenhead—Cloak-room at Baths	Corporation	C. Brownridge, Town Hall, Birkenhead.
,, 20	Bridlington—Greenhouse	Cemetery Committee	E. R. Matthews, Town Hall, Bridlington.
,, 20	Cowbridge—Additions, &c., to School	Glamorgan County Council	T. M. Franklen, County Offices, Westgate Street, Cardiff.
,, 20	Wallsend—Mortuary, &c.	Corporation	G. Holling, Corporation Offices, Wallsend.
,, 21	Maidstone—Reconstruction of Court Fittings	Standing Joint Committee	County Architect, 86 Week Street, Maidstone.
,, 21	Maindy, Pentre—Seven Villas	Building Club	W. D. Morgan, Victoria Chambers, Pentre, Glamorgan.
,, 21	Pontypool—Pair of Villas	———	D. J. Lougher, Bank Chambers, Pontypool.
,, 22	Cobham, near Gravesend—Laundry, &c.	Strood R.D.C.	A. E. Loach, 8 Northcote Road, Stroud.
,, 24	Poole—School Building	Education Committee	W. Andrew, Architect, Parkstone.
,, 24	Washington, Durham—School, &c.	———	Davidson & Phillipson, 32 Clayton Street W., Newcastle-on-Tyne.
	ENGINEERING:		
March 16	Gloucester—Plant	Electricity Supply Committee	G. S. Blakeway, Guildhall, Gloucester.
,, 16	Lancaster—Excavating Work, &c., in connection with Removal of Car Shed.	Tramways Committee	Tramway Engineer's Office, Electricity Works, Marton St., Lancaster.
,, 17	Dundonald, N.B.—Water and Sewerage Works	Kilmarnock District Committee.	J. Sturrock, 65 King Street, Kilmarnock
,, 17	Ledbury—Sinking Well	Urban District Council	R. G. Gourney, Worcester Road, Ledbury.
,, 17	Mauchline, N.B.—Sewerage Works	Kilmarnock District Committee.	J. Sturrock, 65 King Street, Kilmarnock.
,, 18	Killarney—Disinfecting Apparatus	Rural District Council	P. Carey, Boardroom, Workhouse, Killarney.
,, 20	Margate—Laying Mains	Corporation	N. McK. Barron, 15 Cecil Square, Margate.
,, 20	Rothwell, near Leeds—Pumping Machinery	Urban District Council	E. J. Silcock, 10 Park Row, Leeds.
,, 20	Sutton, Surrey—Water-softening Works	District Water Co.	W. V. Graham, 5 Queen Anne's Gate, S.W.
,, 21	Chipping Norton and King's Sutton—Bridge	Gt. Western Railway Co.	Engineer's Office, Paddington, W.
,, 21	Stonehaven, N.B.—Extension of Harbour	Harbour Trustees	Clerk to Trustee, Stonehaven.
,, 21	Briton Ferry, Wales—Gas Engine, &c.	Urban District Council	J. Mogford, Gasworks, Briton Ferry.
,, 21	Wells, Somerset—Waterworks	Rural District Council	A. G. Russ, Poor Law Offices, High Street, Wells.
	IRON AND STEEL:		
March 16	Swansea—Pipes, &c.	Rural District Council	T. T. Williams, Alexandra Road, Swansea.
,, 16	Reading—Tools and Ironmongery, &c.	Corporation	J. Bowen, Town Hall, Reading.
,, 17	Cheltenham—Ironmongery	Corporation	J. S. Pickering, Municipal Offices, Cheltenham.
,, 18	Burnley—Ironwork, &c.	Highways & Sewage Committee	G. H. Pickles, Town Hall, Burnley.
,, 20	Hemsworth, near Wakefield—Tank	Rural District Council	T. H. Richardson, Hemsworth.
,, 20	Dublin—Steel Balconies	Corporation	City Treasurer's Office, Dublin.
,, 21	Evesham—Pipes	Town Council	R. C. Mawson, Town Hall, Evesham.
,, 23	Aston Manor—Iron Castings, &c.	Public Works Sub-Committee	G. H. Jack, Council House, Aston Manor.
,, 27	Welwyn, Herts—Pipes	Rural District Council	H. Walker & Son, Albion Chambers, King Street, Nottingham.
,, 27	Clayton-le-Moors—Ironwork	Urban District Council	A. Dodgeon, Surveyor, Clayton-le-Moors.
April 3	Verulam, Natal—Pipes	Local Board	G. B. Laffan, Hardy's Chambers, Printing Office St., Pietermaritzburg.
	PAINTING AND PLUMBING:		
March 16	Reading—Oils and Paints	Corporation	J. Bowen, Town Hall, Reading.
,, 17	Cheltenham—Oils and Colours	Corporation	J. S. Pickering, Municipal Offices, Cheltenham.
,, 17	Godstone, Surrey—Oils, &c.	Rural District Council	J. George-Powell, Godstone, Surrey.
,, 17	Great Yarmouth—Oils and Sundries	Urban Sanitary Authority	J. W. Cockrill, Town Hall, Great Yarmouth.
,, 20	Oxford—Painting Work at Cemeteries	Corporation	City Engineer, Town Hall, Oxford.
,, 20	Nelson, Lancs—Oils, &c.	Plans and Building Committee	B. Ball, Town Hall, Nelson.
,, 20	Darlington—Oils	Corporation	G. Winter, Town Hall, Darlington.
	ROADS AND CARTAGE:		
March 16	Eastbourne—Road Materials	Rural District Council	T. E. V. Kirtland, 92 Terminus Road, Eastbourne.
,, 16	Reading—Granite, &c.	Corporation	J. Bowen, Town Hall, Reading.
,, 16	London, S.E.—Stock Bricks	Lambeth Borough Council	H. Edwards, 346 Kennington Road, S.E.
,, 16	Belfast—Artificial Flags	Works Committee	Superintendent of Works' Office, Town Hall Street, Belfast.
,, 16	Ormskirk, Lancs—Road Materials	Rural District Council	C. Law-Green, Surveyor to Council, Wigan Road, Ormskirk.
,, 16	Reading—Granite, &c.	Corporation	J. Bowen, Town Hall, Reading.
,, 16	Minster, near Ramsgate—Granite Spalls	Guardians	Clerk, Boardroom, Workhouse, Minster.
,, 16	Berwick—Road Works	Rural District Council	H. A. Peters, 36 Ravensdowne Road, Berwick.
,, 17	Rothwell, near Leeds—Road Materials	Urban District Council	J. Southwart, Council Offices, Rothwell.
,, 17	Godstone, Surrey—Road Materials	Rural District Council	J. George-Powell, Godstone.
,, 17	Cheltenham—Broken Stone, &c.	Corporation	J. S. Pickering, Municipal Offices, Cheltenham
,, 18	Burnley—Flags, &c.	Highways & Sewage Committee	G. H. Pickles, Town Hall, Burnley.
,, 18	Epsom—Kerbing and Channelling	Urban District Council	E. R. Capon, Bromley Hurst, Church Street, Epsom.
,, 18	London, W.—Road Materials	Paddington Borough Council	Borough Surveyor's Office, Town Hall, Paddington.
,, 18	Alnwick—Road Materials	Rural District Council	District Surveyor, Guardians' Boardroom, Alnwick.
,, 18	Bournemouth—Granite	Roads Committee	F. W. Lacey, Borough Surveyor, Bournemouth.
,, 20	Gloucester—Stone	Rural District Council	F. E. Weaver, Lipton Chambers, Northgate Street, Gloucester.
,, 20	Knutsford—Road Materials	Bucklow R.D.C.	J. Burgess, Tabley, Knutsford.
,, 20	Maidstone—Road Materials	Urban District Council	T. F. Bunting, Fair Meadow, Maidstone.
,, 20	Mumbles, Swansea—Road Materials	Urban District Council	M. Hoskins, Surveyor, Mumbles.
,, 20	Newark—Granite	Urban District Council	Borough Surveyor, Town Hall, Newark.
,, 20	Newton Abbot, Devon—Macadam Stone	Urban District Council	L. Stevens, Town Hall, Courtenay Street, Newton Abbot.
,, 20	Sculcoates, Hull—Granite, &c.	Rural District Council	A. Greaves, Woodbine Villa, Hessle.
,, 20	Spennymoor, Durham—Street Works	Urban District Council	C. R. Spencer, Silver Street, Spennymoor.
,, 20	Wellingborough—Granite	Rural District Council	W. Jackson, Clerk, Wellingborough.
,, 20	Worksop—Slag	Urban District Council	G. H. Featherstone, Town Hall, Worksop.
,, 20	Kingston-on-Thames—Granite	Guardians	J. Edgell, Union Offices, Norbiton, Kingston-on-Thames.
,, 21	Uppingham—Granite	Rural District Council	F. Oakley, Clerk, Uppingham.
,, 21	Diss, Norfolk—Granite	Urban District Council	A. Cooper, The Terrace, Diss.
,, 21	Ely—Granite, &c.	Rural District Council	E. R. Ernals, Lynn Road, Ely.
,, 21	Tendring, Essex—Flints	Highways Committee	J. Bell, Highways Surveyor, Wheeley, Colchester.
,, 22	Leeds—Improvement Works	Unhealthy Areas Committee	City Engineer's Office (Unhealthy Areas Improvements Department), Municipal Buildings, Leeds.
,, 22	Strood, Kent—Road Materials, &c.	Rural District Council	J. E. Povey, Clerk, Workhouse, Strood.
,, 22	Elham, Kent—Road Materials	Rural District Council	A. Hambrook, Surveyor, Lyminge, Kent.
,, 22	Lowestoft—Road Materials	Rural District Council	S. G. Bloy, Surveyor's Office, Oulton Broad, Lowestoft.
,, 22	Northampton—Repaving Cattle Market	Corporation	A. Fidler, Guildhall, Northampton.
,, 22	Strood, Kent—Road Materials	Rural District Council	J. E. Povey, Clerk, Workhouse, Strood.
,, 23	Aston Manor—Roadstone	Public Works Sub-Committee	G. H. Jack, Council House, Aston Manor.
,, 23	Witney, Oxon.—Road Materials	Rural District Council	G. Wallis, Brampton, Oxon.
,, 25	Hayward, Lancs—Flags, &c.	Corporation	J. A. Settle, Borough Engineer, Haywood.
,, 27	Clayton-le-Moors—Granite, &c.	Urban District Council	A. Dodgeon, Surveyor to Council, Clayton-le-Moors.
,, 28	West Malling, Kent—Road Materials	Rural District Council	J. Marshall, Surveyor, Westlling.

Complete List of Contracts Open.—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	SANITARY:		
March 16	Bridge, Canterbury—Scavenging	Rural District Council	Mr. Croft, Bridge, Canterbury.
,, 16	Carlton, Barnsley—Scavenging	Barnsley R.D.C.	J. Senior, Clerk to Parochial Committee, Carlton.
,, 17	Cheltenham—Disinfectants	Corporation	J. S. Pickering, Municipal Offices, Cheltenham.
,, 18	Epsom Disinfectants	Urban District Council	E. R. Capon, Bromley Hurst, Church Street, Epsom.
,, 18	Bournemouth—Drainage Works	Town Council	F. W. Lacey, Borough Surveyor, Bournemouth.
,, 20	Knottingley—Sewers	Urban District Council	Garside & Pennington, Pontefract.
,, 20	Rothwell, near Leeds—Sewerage Works, &c.	Urban District Council	E. J. Silcock, 10 Park Road, Leeds.
,, 20	Darlington—Disinfectants	Corporation	G. Winter, Town Hall, Darlington.
,, 20	Bangor—Two Lavatories	Urban District Council	J. Milliken, Town Hall, Bangor, co. Down.
,, 22	Cefn, near Ruabon—Sewage-disposal Works, &c.	Wrexham U.D.C.	J. P. Evans, Argyle Chambers, Wrexham.
,, 28	Glasgow—Sewers	Corporation	City Engineer, City Chambers, 64 Cochrane Street, Glasgow.
,, 28	Shere, Surrey—Sewerage Works	Guildford R.D.C.	W. S. O. Cullerne, Commercial Road, Guildford.
,, 31	Featherstone, Yorks—Sewage Works	Urban District Council	Council Offices, Featherstone.
,, 29	London, S.E.—Removal of Refuse	Trustees of Borough Market	Market Offices, Cathedral Street, Southwark.
	TIMBER:		
March 16	Reading—Wood Blocks	Corporation	J. Bowen, Town Hall, Reading.
,, 17	Great Yarmouth—Timber	Urban Sanitary Authority	J. W. Cockrill, Town Hall, Great Yarmouth.
,, 17	Cheltenham—Timber	Corporation	J. S. Pickering, Municipal Offices, Cheltenham.
April 3	Cape Town—Hardwood Sleepers and Timber	Commercial Intelligence Branch of Board of Trade.	Offices of Commercial Intelligence Branch of Board of Trade, 73 Basinghall Street, E.C.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &C.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
March 30	London, S.W.—Municipal Buildings	——	£1	H. J. Smith, Town Hall, Kennington, S.W.
,, 31	Chippenham—School	£30 & £20	——	W. Pullinger, Education Department, County Offices, Trowbridge.
,, 31	London, S.E.—Clock Tower	£20, £15 & £10	——	Thomson & Pomeroy, 49 Hill Road, Wimbledon.
,, 31	Trowbridge—School	£30 & £20	——	W. Pullinger, Education Department, County Offices, Trowbridge.
April 5	Maesteg, Wales—Chapel	——	——	W. G. Roberts, Secretary, Llysderfel, Maesteg.
June 1	Letchworth (Garden City)—Cottages	——	——	W. V. Cooper, 347 Birkbeck Bank Chambers, High Holborn.
,, 17	Cardiff—Libraries	£75 & £50	——	Chief Librarian, Central Libraries, Cardiff.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

Tenders.

Chesham (Bucks)—For the erection of a residence at Codmore, for Mrs. Hickman. Messrs. Stokes & Pinder, surveyors, 49, Upper Baker Street, Marylebone:—

G. Darlington	£1,720
W. Abbott & Son	1,690
A. Wright	1,590
F. G. Rust	1,500
J. Mead*	1,445

* Amended tender accepted.

Heaviley (Stockport).—Accepted for the erection of new mixed schools, for the Trustees of St. George's Schools, Heaviley. Messrs. Austin & Paley, architects, Lancaster:—

Smith Brothers, Ltd., Burnley	£13,021	5	10

Leyton.—For the erection of a shop. Mr. Herbert Riches, architect, 3, Crooked Lane, King William Street, London, E.C. Quantities supplied:—

Courtney & Fairbairn	£1,959	0	0
Fred & T. Thorne	1,853	0	0
Battley, Sons & Holness	1,843	0	0
Clemens Brothers	1,840	10	0
Todd & Newman	1,836	0	0
Sheffield Brothers	1,786	0	0
Thomas Osborn & Sons*	1,783	0	0

* Accepted.

London, N.—For sanitary and drainage works at the Detmold Road School, Hackney, for the London County Council Education Committee:—

A. E. Symes, Stratford	£3,489
Ashby Brothers, 6, Union Court	2,921
McCormick & Sons, Essex Road	2,734
G. Munday & Sons, Trinity Square	2,516
E. S. S. Williams & Son, Barnsbury	2,473
Lathey Brothers, Battersea Park	2,455
J. Wilmott & Sons, Hitchin	2,442
J. Peattie, Baker Street	2,435
A. Porter, Tottenham	2,390
E. Lawrance & Sons, City Road	2,386
L. H. & R. Roberts, Islington	2,365
Stevens Brothers, Seven Sisters Road	2,314
F. Bull,* Old Hill Street, Upper Clapton	2,246

* Recommended for acceptance.

London, E.—Accepted for external repairs and paintings at "The Lamb" public-house, Plaistow. Mr. Herbert Riches, architect, 3, Crooked Lane, King William Street, E.C.:—

A. W. Derby	£104	0	0

London, W.—Accepted for extensions to the Chiswick Soap Works, for the Chiswick Soap Co. Messrs. Scott & Hanson, architects and surveyors, 10, Basinghall Street, E.C.:—

Extension to stables and enclosure to boilers, &c.

Mitson & Harrison, Camberwell.

Machinery room, drying ovens, large stores and new boundary wall.

George Bollom, Acton.

London, S.W.—For the erection of a new generating station at Manor Street, Chelsea, for the Chelsea Electricity Supply Co., Ltd. Mr. Alfred Roberts, architect, 92, London Street, Greenwich:—

H. & F. H. Higgs	£14,313
B. E. Nightingale	£13,498
Lole & Co.	13,242
F. & T. Thorne	13,200
Patman & Fotheringham	12,923
Holliday & Greenwood, Ltd.	12,666
J. Greenwood, Ltd.*	11,865

* Accepted.

London, W.—Accepted for constructional steelwork at new fitting and testing shops at Chiswick, for Messrs. John I. Thornycroft & Co., Ltd., shipbuilders and engineers. Messrs. Scott & Hanson, architects and surveyors, 10, Basinghall Street, E.C.:—

A. & J. Main & Co., Ltd., 49, Cannon Street, E.C.

Long Eaton.—Accepted for the erection of Primitive Methodist church. Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines, architects, 5, Clement's Inn, Strand, London:—

Estimates A, B and I.

John, Bull, Cobden Street, Long Eaton	£2,534	5	0

Morpeth.—For the erection of cottage homes, for the Guardians of Morpeth Union (Northumberland). Mr. L. A. Loades, architect, Market Place, Morpeth:—

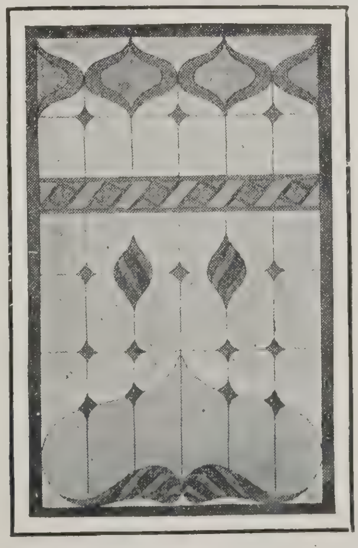
Original estimates.

R. C. Hall	£3,951	4	0
J. Brady, Newcastle-on-Tyne	3,538	16	10
J. Weallens	3,515	4	9
Waterston & Sons	3,432	10	3
George Dixon	3,395	3	7
Curtis & Braithwaite	3,392	16	6
James Jeffrey	3,387	9	0
John Jackson, Newcastle-on-Tyne	3,350	0	0
P. Cuthbert	3,300	0	
T. A. Turnbull, Newcastle-on-Tyne	3,278	0	
R. Carse & Son*	3,270	19	2
Gordon Brothers	3,250	7	0
J. & G. Green,* Warkworth	2,950	0	0
William Beattie*	2,828	16	0
Ritchie, Whitley	2,826	12	3
Gibson Brothers, Newbiggin-by-the-Sea	2,671	9	8

[Rest of Morpeth.]

* Selected for further consideration, after modification.

(Continued on p. xxiv.)



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TENDERS - *cont. from p.* xxiii.

Naas (Ireland).—For carrying out the Newbridge water-supply works, for the Naas No. 1 Rural District Council. Mr. F. Bergin, borough engineer, Beechgrove, Kildare :—

Sunlight Gas Engineering Co., Dublin	£4,384	9	0
J. Taylor, Brannoxtown	4,363	3	2
A. Hull & Co., Dublin	4,142	1	7
McKee & McNally, Dungannon	4,055	17	10
J. Kennedy, Dublin	4,019	4	3
J. Collen, Dublin	4,000	0	0
J. Graham, Dromore, co. Down	3,954	14	4
G. L. Johnston, Rathmines	3,744	12	4
W. Baird, Dublin	3,559	2	11
P. Sheridan, Newbridge	3,377	4	11
P. Blake, Dublin	3,998	19	8
J. Kelly,* Parliament Street, Kilkenny	3,262	1	5

* Accepted.

Newcastle-on-Tyne.—Accepted for the erection of 126 artizans' houses on a site between Walker and St. Lawrence Roads, for the City Council :—

W. Franklin & Sons, Ltd., Jesmond ... £18,177

Risca (Mon.).—For the erection of 50 houses at Wattsville, North Risca, for the U.D.C. Mr. A. J. Dardis, surveyor :—

T. Thorne	£17,997
J. Charles	12,500
A. S. Morgan & Co.	11,995
J. Lewis, Caerphilly	11,425
E. C. Jordan	11,250
J. Pritchard,* Pontymister	10,750

* Accepted. [Rest of Newport.]

Selly Oak.—For the erection of public baths, including chimney shaft and storage-tank, at Tiverton Road, for the King's Norton and Northfield Urban District Council. Mr. E. Harding Payne, A.R.I.B.A., architect, 11, John Street, Bedford Row, W.C. Quantities by Mr. George Kenwrick, F.S.I., 83, Colmore Row, Birmingham :—

W. J. Morris	£10,038
J. Barnsley & Son	9,888
T. Loud & Sons	9,875
J. A. Turton*	9,858
J. Dallow & Sons	9,790
T. Rowbotham	9,707
W. & J. Webb	9,600
W. Bishop	9,477
B. Whitehouse	9,378
W. Harvey Gibbs	9,235
T. A. Cole & Son†	8,990

* Revised estimate. † Accepted.

Southampton.—Accepted for an extension to the Woolston Works, for Messrs. John I. Thornycroft & Co., Ltd., shipbuilders and engineers. Messrs. Scott & Hanson, architects and surveyors, 10, Basinghall Street, E.C. :—

Extension to iron foundry.

Builder's work—T. Nichols, Bitterne.
Constructional steelwork—A. & J. Main & Co., Ltd.

Shipyard sheds.

Builder's work—T. Nichols.
Constructional steelwork—Edward Wood & Co., Ltd., 88, Cannon Street, E.C.

Core stove and flues.

Builder's work—J. Barrett, Bitterne.

Southend.—For the erection of a building for manual instruction, &c., adjoining the London Road Schools, Queen's Road, for the Corporation. Mr. Ernest J. Elford, borough surveyor :—

A. J. Arnold	£1,583
S. E. Moss & Co.	1,524
G. W. Smith, Leigh-on-Sea	1,500
F. Miskin, Rochester	1,472
Myall & Upson, Clacton-on-Sea	1,382
F. & E. Davey, Ltd.	1,381
R. Elvey & Son, Southchurch	1,340
A. & H. Holding, Southchurch	1,294
W. & E. Davey*	1,187

[Surveyor's protecting tender, £1,400.]

* Accepted. [Rest of Southend.]

Southend.—For the erection of a boiler-house, for the Corporation. Mr. E. J. Elford, borough surveyor :—

F. & E. Davey	£2.045
H. Lovett, Ltd., West Kensington	2,000
H. Windsor & Co., Fulham	2,000
G. W. Smith	1,943
Hughes & Stirling, Strand, W.C.	1,888
A. & H. Holding, Southchurch	1,805
S. E. Moss & Co.	1,777
F. Miskin, Rochester	1,771
A. J. Arnold	1,757
R. Elvey & Son, Soathchurch	1,679
W. & E. Davey*	1,558

[Survevor's protecting tender, £1,716.]

* Accepted. [Rest of Southend.]

Widnes.—For the enlargement of Simm's Cross Council School, for the Education Committee. Mr. F. U. Holme, architect, Westminster Chambers, 1, Crosshall Street, Liverpool :—

Jones & Son	£2,500
J. Merritt	£2,062
Holme & Green	2,040
S. Webster	2,007
F. W. Mayor	1,999
W. Hall & Son	1,949
P. Tyson	1,937
J. Gerrard & Son	1,915
G. Woods & Son	1,915
Rothwell & Sons	1,911
Duthie & Dobson	1,910
T. Fairclough	1,870
Hughes & Stirling	1,850
Lucas & Son	1,835
J. & E. Rimmer,* Gateacre, Liverpool	1,781
Parker & Son	1,775

* Accepted.

Walthamstow.—For the erection of Winns Avenue Schools, for the Education Committee. Mr. H. Prosser, architect to the Committee :—

Oak Building Co.	£28,779
Martin, Wells & Co.	28,353
Rowley Brothers	27,800
C. Wall, Ltd.	27,554
C. Roper	26,999
H. J. Carter	26,829
Treasure & Son	26,600
A. E. Symes	26,500
Pollard & Brand	26,483
Knight & Son	26,362
Coxhead	26,220
Shurmur	25,983
Kerridge & Shaw	25,955
R. & E. Evans	25,885
W. Manders	25,584
Maddison	25,163
F. & E. Davey	24,987
W. Lawrence	24,844
Kilby & Gayford	24,583
Hammond & Son,* Romford	23,881

* Accepted.

West Ham.—For the extension of the public baths in Balaam Street, Plaistow, for the West Ham Town Council. Mr. J. G. Morley, borough engineer :—

H. C. Horswell, Forest Gate	£3,063
J. G. Horlock & Son, Barking Road	2,668
A. E. Symes, Stratford	2,550
Gregan & Son, Stratford	2,480
Works Manager,* Canning Town	2,456
A. G. Crisp, Walthamstow	2,440
W. Manders, Leyton	2,425

* Accepted.

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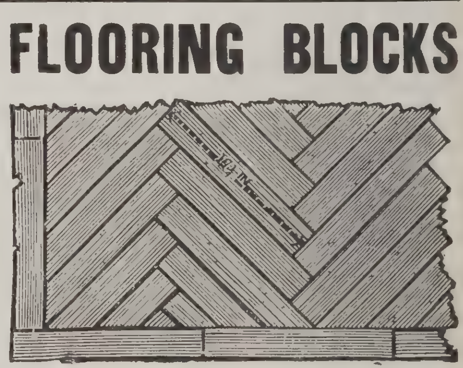

Per 100 Blocks out of sizes.	YELLOW.		PITCHPINE
	At Wharf.	ex Ship within one Month.	At Wharf.
17¼ × 3 × 3	12 9	12 0	16 6
17¼ × 3 × 2	8 3	7 9	11 5
17¼ × 3 × 1½	6 9	6 3	9 0

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MONTHLY

FIRE SUPPLEMENT

TO THE

BUILDERS' JOURNAL AND ARCHITECTURAL RECORD.

Edwin O. Sachs, F.R.S.Ed., Architect,
Consulting Editor.

Number 5.
March, 1905.

SUMMARY.

The Institution of Electrical Engineers' rules for wiring, as they stand at present, are not sufficiently stringent for the temporary wiring found constantly at bazaars, exhibitions, temporary ballrooms and the like, and the sooner this matter is remedied in the Institution's rules, and supply companies follow suit, the better for the consumer of electric light. (Page 62.)

The Long Acre Fire of February 22nd serves as an instance of the everywhere increasing risk of the rapid spread of fire in the congested areas of the Metropolis, and at the same time illustrates the danger of the increasing quantities of petrol to be found in manufacturing premises in London. The latter matter should call for careful investigation. (Page 64.)

Mr. Justice Buckley's judgment in connection with the L.C.C.'s requirements as to safeguards against danger from fire at the City Mills building appears to make it practically impossible for the Council to deal with any "old" factory premises other than those which are wholly in one occupation and those the whole of which are occupied as factories, the mechanical power for which is supplied from one common source; and it would be easy for the owner of a factory building, by letting such building to more than one occupier, to nullify the provision of section 14 of the Factory and Workshop Act, 1901. (Page 65.)

Taken as a whole, as far as fire protection is concerned the Building Act Amendment Bill of the London County Council is obviously a good one, and, further, in the interests of the future development of the Metropolis. We are somewhat astounded at the intensely ignorant and interested opposition to the Bill manifested in the City area, and our astonishment is still greater when we remark a small Bill which has been quietly lodged on behalf of the City Corporation in which powers quite as drastic, if not more drastic in certain directions, are desired by that body. (Page 66.)

It would be well if the primary principles of how to deal in case of fire with specific theatres in given areas were thought out and made subject to some kind of tactical exercise, as, for instance, the war game as played in the Army. A step in this direction has been taken by Chief Officer Dittman, of Bremen, who has schemed out various methods of handling various kinds of fires that might occur at the theatres in his city. (Page 72.)

Attention needs to be called to the increasing hazard of fire occasioned by the telephone service, a hazard which does not only refer to the actual premises of such exchanges but also refers to the property over which there are standards carrying the telephone wires. (Page 67.)

TEMPORARY BALLROOMS.

Mr. Lionel Phillips's Fire at Grosvenor Square.

In our leading article of February 15th we commented upon the action that Mr. Lionel Phillips, of Grosvenor Square, brought in such a public-spirited manner against a firm of caterers in respect to a ballroom that was burnt down just before an evening party he was about to give.

We call this temporary erection a ballroom, the more common expression for the canvas temporary erections used for entertainments of this kind, though, as a matter of fact, on going into the matter we find that this temporary structure was to be used not as a ballroom but as a supper-room.

We consider the case to be such an important one in the interests of the safety of life that we have been at some pains to gather full particulars, and we have had some photographs and drawings put at our disposal, which should materially assist to elucidate the circumstances.

As we have indicated before, as far as the plaintiff was concerned, Mr. Lionel Phillips's case was an unusually well-prepared one from the technical point of view, the solicitors in charge, Messrs. Braunstein & Skelton, having gone into the matter very thoroughly and having retained experts of high standing, who also assisted very materially in the preparation of models, diagrams and the like.

The case was not won by Mr. Lionel Phillips, the jury unfortunately taking the view that the actual cause of the outbreak was not proven, and thus of course the alleged neglect of the caterer was not judicially shown. We think the jury took a mistaken view, particularly if we read the careful summing up by the judge, but of course it was an extraordinarily difficult case to prove by circumstantial evidence, and if the jury gave the defendant caterers the benefit of a doubt, no more can be said than that it was fortunate for the defendants that the case was not tried by the judge alone or, as a matter of fact, decided by any one with a legal training. It is extremely regrettable that an example could not be made of the caterers, who were a representative firm of a trade that so obviously does not think it worth while to give any thought to the question of fire protection generally or to the safety of clients, quite irrespective of any question of electrical defects in this particular case.

In this supplement we present a plan and sections showing the location of the temporary building and its relation to the permanent structure. We also show two photographs of the ruins after the fire, and further some diagrams indicating what kind of wiring was adopted in applying the so-called "looping" system with miniature lamps for the illumination of the temporary room.

As to the general tenour of the circumstances, we think it cannot do better than to quote two journals, which should necessarily if anything be inclined to overlook electrical failings, seeing that they represent the engineering professions. The two journals in question are "Engineering" and the "Electrical Review," the former of which gives a terse general illustrated article on the subject, whilst the latter gives a very trenchant leader. We will quote the article from "Engineering" at considerable length, with a view of obtaining a description of the circumstances and the views of this highly-respected contemporary, whilst regarding the "Electrical Review" we will give the opinions therein expressed.

We trust that this case will in the first place have the due consideration of the Institution of Electrical Engineers, and in the second place the consideration of the British Fire Prevention Committee within whose sphere a case of this kind certainly comes for action. We further trust that the London County Council, and particularly the Committee entrusted with the administration of the London Building Act, will consider this case, and that it will, lastly, be brought to the notice of the Home Office.

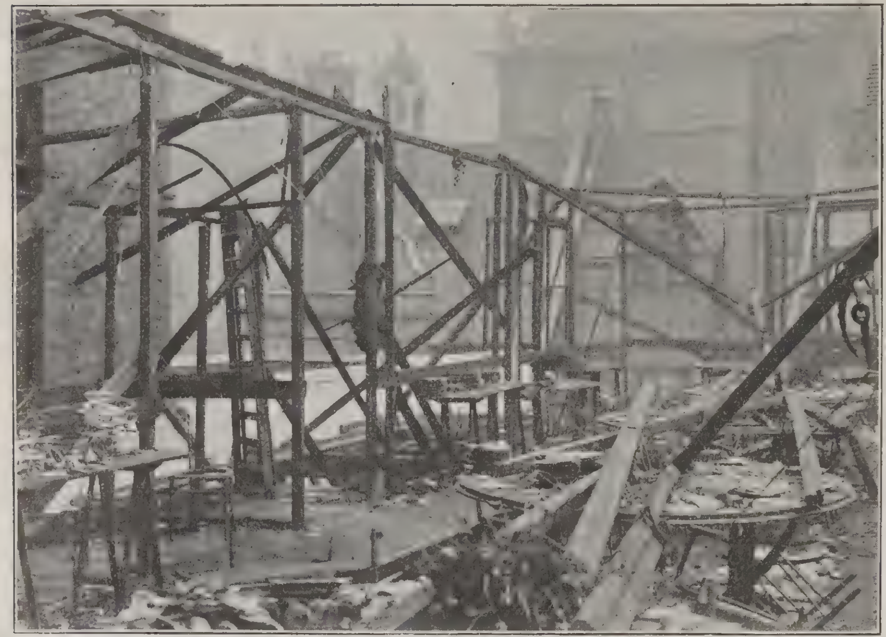
The Circumstances.

"Engineering" states as follows:—

In short, this was a case where a wealthy amateur proposed to arrange an evening party and concert, practically regardless of expense, and for this purpose had a large temporary supper-room erected at the rear of his private residence, on the top of a back addition at first-floor level. The temporary structure was of the usual wood skeleton frame and canvas type, to hold about 200 persons, and small electrical incandescent lights were fitted to serve as the illuminant.

A few hours before the party was to commence—*i.e.*, about dinner time—a fire broke out in this temporary structure and destroyed it entirely in the course of a few minutes. It further did considerable damage to the house, the flames entering the latter through the back windows. According to the official report sent out to the insurance companies by the London Fire Brigade, the cause of this fire was a defective electric circuit; and although the jury did not take the view that this cause had been proved in such a way as to make the caterers liable for damages, yet the result should be to cause greater care to be expended on these temporary installations in the future than has sometimes been done in the past.

Had this fire occurred during the course of the party it seems certain that a number of fatalities must have resulted, for in many respects this structure was even of a more dangerous character than that of the fatal Charity Bazaar at Paris. It was perched



RUINS OF THE GROSVENOR SQUARE TEMPORARY "BALLROOM," LOOKING TOWARDS STABLES.

aloft on the back addition, as indicated in our illustrations, and anyone attempting to break through the sides of the canvas, in case of panic, would have dropped down into deep areas. There were only two exists—one through the first-floor back room of the house direct to the main staircase, and one down some temporary stairs. The plan which we publish shows that there was a dead end of that dangerous type to this temporary building that is the veriest death-trap on such occasions. The plan illustrations show also the location of this temporary structure and its relation to the house.

Given the requirements of a temporary building in such a position, it would, of course, only be natural to anticipate that the greatest possible care would be observed in its erection. In these enlightened times one would have expected the use of non-inflammable materials throughout, as is customary at public functions. One would have anticipated that the simplest and safest system of electric installation would have been applied, amply guarded by plenty of fuses; and one would not have expected any additional risks to be run by entwining electric lights with ordinary muslin of the most combustible kind. It should be remembered that there was no question of expense, and that the contractors had an entirely free hand, *i.e.*, were able to use their discretion.

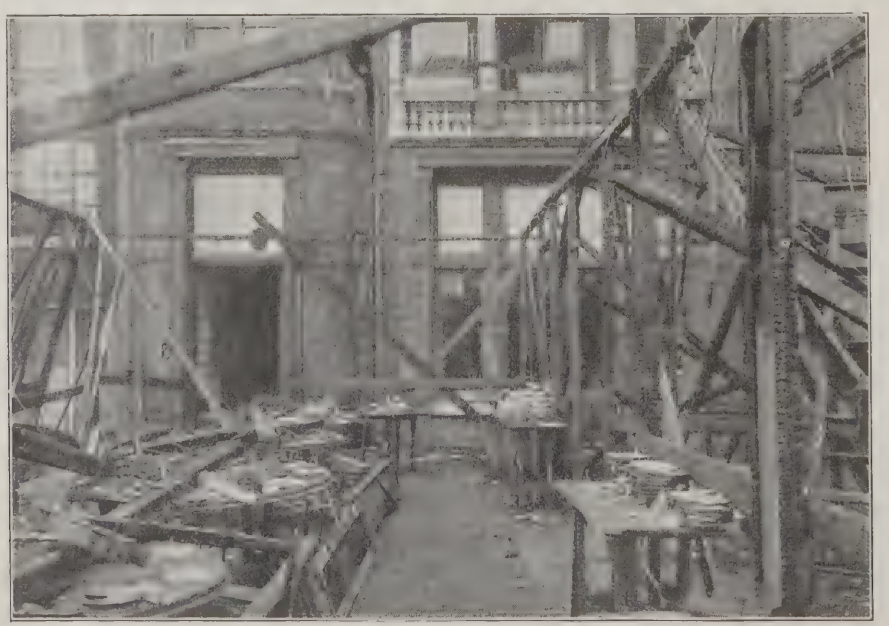
No one apparently having seen the actual outbreak of the fire, the duty of proving the electrical cause rested with Mr. Lionel Phillips, and, what is more, it was necessary for him to prove negligence. He was not able to do this, but we believe that the publicity of the case will serve as a lesson to the catering and allied trades. Put in short, Mr. Lionel Phillips had to show that the system of electric light adopted was a dangerous one, negligently applied, and, further, that due precautions were not taken in the general outfit of this supper-room. The system of lighting actually applied was what is generally known as the looping system, which, although at all times not the simple and safe one that could be desired in such temporary work, is distinctly a dangerous one when used with miniature lamps, which create such considerable difficulty in being connected up. Colonel Crompton, who is not prone to exaggeration, described this system with the application of such miniature lamps as a "diabolically dangerous one" having regard to the purposes for which it was applied. Mr. Swinburne concurred with this expression of Colonel Crompton's and such other expressions as clearly defined this method of installation as one which is attended with risks that should not be undertaken if possible to avoid.

There is one point, however, on which the defendant was naturally able to make an impression on the jury, and that was that there is no prohibition in any wiring rules regarding this special form of temporary installation; and we would here point out that we hold that the Institution of Electrical Engineers should elaborate their rules to cover these points and points relating to temporary wiring generally. There can be no doubt about it that the Institution of Electrical Engineers' rules, as they stand at present, are not sufficiently stringent for the temporary wiring found constantly at bazaars, exhibitions, temporary ballrooms and the like, and the sooner this matter is remedied in the Institution's rules, and supply companies follow suit, the better for the consumer of electric light. Perhaps this point as to the necessity for elaboration of the Electrical Institution's rules may be said to be the primary lesson of the case.

Some Lessons.

Another important lesson which, although it has long been learnt by consulting electrical engineers, has not yet been sufficiently recognized by the ordinary minor electrical contractor, is that the supply companies' ordinary test is not a test in respect to the satisfactory character of the wiring from the fire point of view, but is simply a test for insulation. There is a general and, unfortunately, very popular belief that the companies' test practically means immunity from risk of electrical fires; but this is wrong, and we think the supply companies in their own interests should make this fact a great deal plainer to contractors and private parties when corresponding on this question of tests and the issue of certificates. We are of course fully aware what is meant and what stands as written in the rules and instruction books of supply companies to their staffs on this matter, but the popular belief that the supply companies' tests mean immunity from the risks of fire should be broken down at the earliest possible moment.

The third lesson on the electrical side is undoubtedly that it is very much in the insurance companies' interest to extend their electrical staffs, and to organize them on a thoroughly practical and efficient footing. We are of course aware that some companies are most ably managed in this direction, and that although they would be the last to officially own to it—seeing that officially they do not recognize the value of fire prevention—a great deal of substantial fire-preventive work is done by the companies in this special direction. We should not forget that it was an insurance company's surveyor—who has recently retired—who was practically the father of wiring rules and inspections in this direction, but a great deal more should be done on the insurance side. If statistical records were also carefully kept by the companies as to the causes of outbreak of fire, we think the percentage of electrical fires would be a great deal higher than we estimate. We are of course conversant with the fact that first-class contractors and work done under experienced consulting engineers stand high in this country; in fact higher than in most countries; but the amount of slipshod work done by incompetent minor firms, generally of the plumber and ironmonger type, is simply appalling, whilst the modern tendency for caterers, co-operative stores, furniture dealers, office-fitters, &c., to do work outside their own ken, and to take on electrical wiring both permanent and temporary, must mean grave risk. Even here, in the case we have under review, we have the defendants getting in the box and



RUINS OF THE GROSVENOR SQUARE TEMPORARY "BALLROOM," LOOKING TOWARDS THE HOUSE.

naturally saying that they knew nothing about electricity and that this department was left to some subordinate or to some sub-contractor as to whose competence or knowledge of the subject they did not furnish any conclusive testimony. The insurance companies, no doubt, have the greatest possible facilities for doing fire-preventive work in this direction of electrical supervision, and, if ably handled, such work will always be welcome to the better-class consulting engineer and electrical contractor.

The fourth lesson in respect to this unfortunate fire is one in respect to the necessity of this class of temporary building coming under supervision of our building authorities. Should anyone wish to break a door through an internal wall in his house, or, in fact, make any minor structural alteration, the builder or owner comes under the supervision of the local district surveyor. Should a temporary building be erected of corrugated iron, or a shed of the factory type be desired, these buildings come under the supervision of the London County Council. Temporary buildings of the "stand" type come under the control of the borough councils, although we believe there are still a number of points at issue between the London County Council and the boroughs as to where their respective control commences or ends. But we nowhere find that this class of temporary ballroom of the tent type comes under official regulation except where it be used for public entertainments, when it would come under the Theatres Committee of the London County Council for purposes of licence.

And now the final lesson; without going into any further matters of detail. Throughout this case it was obvious that the contractors had really not had the question of fire prevention in their minds at all. There was not so much as a single pail of water or a single hand-pump available to meet an emergency of this kind. It really is most regrettable that in such work of this kind, executed regardless of expense, there should not have even been an attempt at the commonest form of protection in the direction of a few buckets filled with water to meet a possible outbreak of fire. Ignorance may in a way serve as an excuse in respect to dangerous wiring, and conservatism for an absence of flame-proof materials, but these will not account for the absence of even a single fire-bucket, the most elementary of all safeguards.

Electrical Opinion.

The "Electrical Review" says:—

In the course of expert evidence great emphasis was laid on the fact that the looping system was utilized with small miniature lamps. Experts like Colonel Crompton and Mr. Swinburne were most emphatic as to the dangerous character of the temporary wiring done, and we are sure most electricians would agree that this system with tiny lamps is not appropriate for risky and hurried work of this kind. The defendants tried to show that the looping system with miniature lamps was common practice, but they failed to do this. They also tried to show that the use of non-inflammable materials round electric lamps was not customary at private entertainments, although of course it is a recognized essential at all public entertainments under the L.C.C. control. They argued that they had followed the Institution of Electrical Engineers' wiring rules as to fuses, &c., and we think they had certainly done this; but it should be borne in mind that these rules were intended for permanent work. The general impression that the case made was, firstly, that of callousness in the direction of risk of fire, *i.e.*, that there was no thought as to the electrical risk of the fancy

Fig. 1. Shows a pair of 70/40 flexible cut and ends bared for insertion of a lamp.
Fig. 2. Ends twisted.
Fig. 3. + and − conductors twisted together and forced into lamp holder. Plan view.
Fig. 4. Same—side view.
Fig. 5. Shows how hanging the lamp from its conductors may bring the loose ends left outside the holder into contact and thus cause a short-circuit at the point of the arrow.

Fig. 6. Plan of temporary "ballroom" and temporary approaches.
Fig. 7. Longitudinal section of "ballroom" on first-floor level.
Fig. 8. Longitudinal section showing elevation of adjoining premises.
Fig. 9. Cross-section of "ballroom" showing back elevation of house.

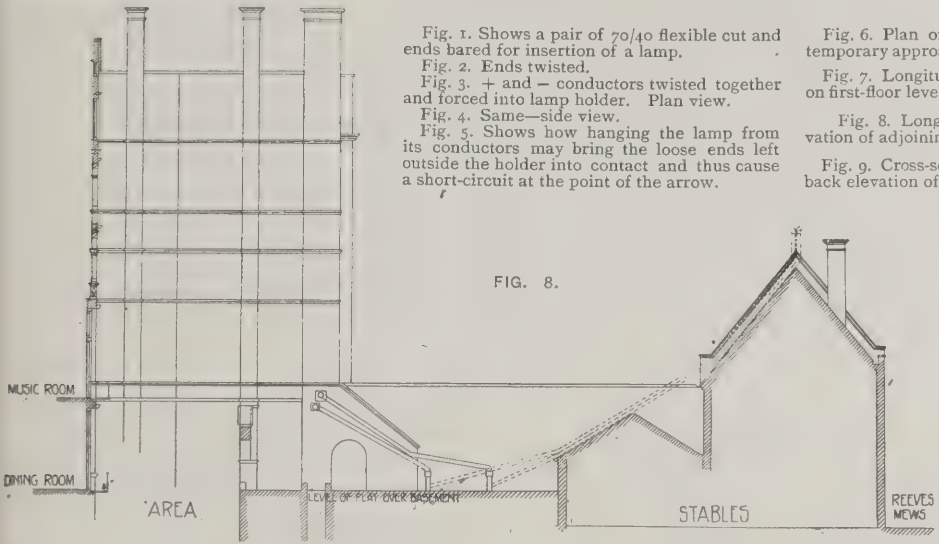


FIG. 8.

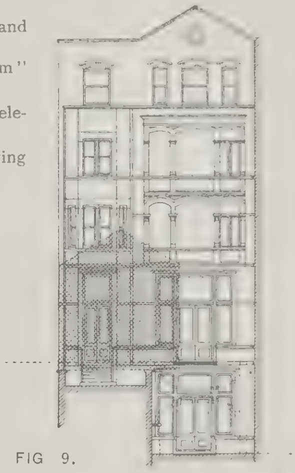


FIG 9.

FIG. 1

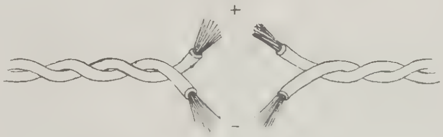


FIG. 2

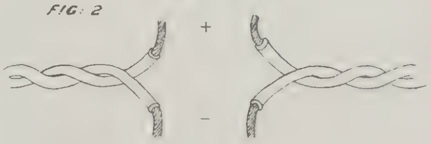


FIG 3

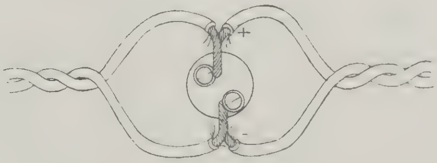


FIG. 4

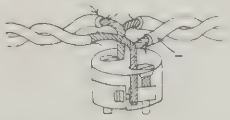
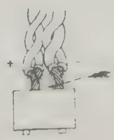
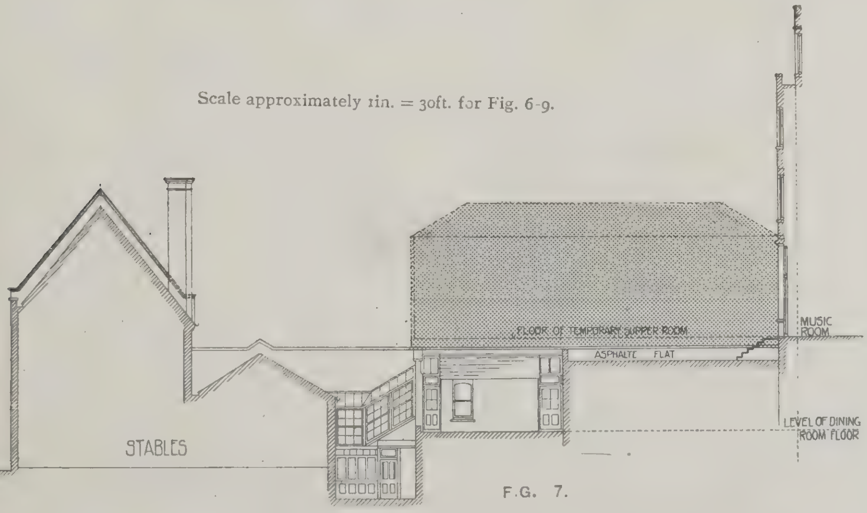


FIG 5



Figs. 1-5, Electrical Details.

Scale approximately 1in. = 30ft. for Fig. 6-9.



F.G. 7.

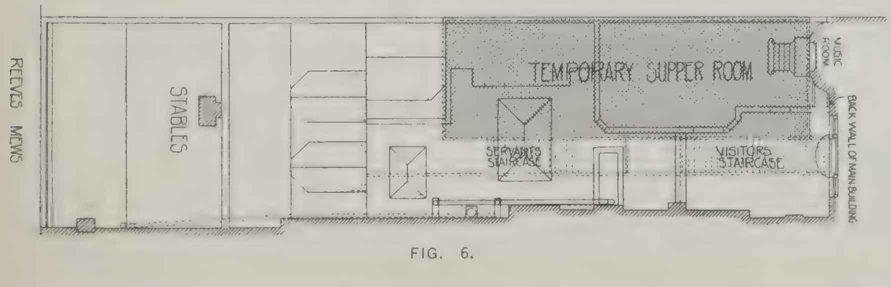


FIG. 6.

SKETCH OF THE GROSVENOR SQUARE TEMPORARY "BALLROOM" AND SOME ELECTRICAL DETAILS.

lighting adopted, nor any thought as to what would happen if there was a "short." This callousness went so far that there were not even any fire appliances about. To put it plainly, there was no recognition of risk at all either on the fire-preventive or fire-extinguishing side.

The next point that was brought out was that although the wiring rules of the Institution of Electrical Engineers may be excellent for permanent work, there should certainly be a supplement pointing out the necessary additional safeguards for temporary work.

Another point was to the effect that laymen contractors seem to pin their faith in respect of questions of safety to the ordinary insulation test conducted by the supply companies, which is of course a fallacy.

Lastly, it was shown that temporary buildings of this character should certainly be quite as much under the supervision of the local authorities as, say, an ordinary temporary building of the iron shed type that has to have a licence, and is certainly of a more substantial character than a canvas one.

Altogether, the case brought some very strong points to light as to the general indifference as to question of safety in temporary work, both constructional and electrical. We trust that those interested in this class of work will take the lesson to heart.

THE LONG ACRE FIRE.

(February 22nd, 1905.)

WE give one of those excellent insurance plans, prepared by Mr. Charles E. Goad, which shows the location of this fire, which occurred in the morning of February 22nd, and resulted in quite a number of buildings being gutted and damaged, supplemented by some special photographs taken on the spot which give some idea of the nature of the property affected.

The fire was a very fierce one, owing to the character of the premises affected, which were poorly constructed and filled with a considerable amount of woodwork, both finished and unfinished, such as motor-car bodies and the like. But an important factor in the severity of this fire must have been the large amount of petrol stored in the various buildings, sometimes, it is true, only in quite small containers, but together constituting a considerable bulk.

The fire originated in the back premises of a building facing Long Acre and bounded on the side by a narrow passage. It spread southwards towards the corner of St. Martin's Lane and Long Acre, getting into various buildings from the back. The fact that the whole corner was not destroyed by fire was solely due to the efforts of the fire brigade, which assembled very promptly and got to work in a most admirable manner, the excellence of the fire-brigade arrangements throughout being the subject of much comment.

Some thirty-eight steam fire-engines were brought into action at this fire, which will give some idea of the quantity of water required in order to limit its extent. The entire Salvage Corps was also brought into service, and did good work in saving a number of very valuable motor articles and other carriages.

The fire was at its height between 8 and 9.30 a.m., and owing to a strong wind required very careful fighting. The area affected, as will be seen from the plan, is quite considerable, particularly behind the buildings fronting Long Acre. It is a matter of congratulation that the fire did not spread across that thoroughfare to any marked extent. Only in one instance, namely, in the case of Messrs. Stanford's premises, did the buildings on the south side of Long Acre catch fire, and this, we believe, was due to flying woodwork which dropped on the roof. The insurance values must have been considerable on this occasion, as the contents were valuable, individual motors costing as much as £700 or more.

The fire serves as an instance of the everywhere increasing risk of the rapid spread of fire in the congested areas of the Metropolis, and at the same time illustrates the danger of the increasing quantities of petrol to be found in manufacturing premises in London. The latter matter requires serious thought, and should call for careful investigation.

THE CITY MILLS BUILDING FIRE.

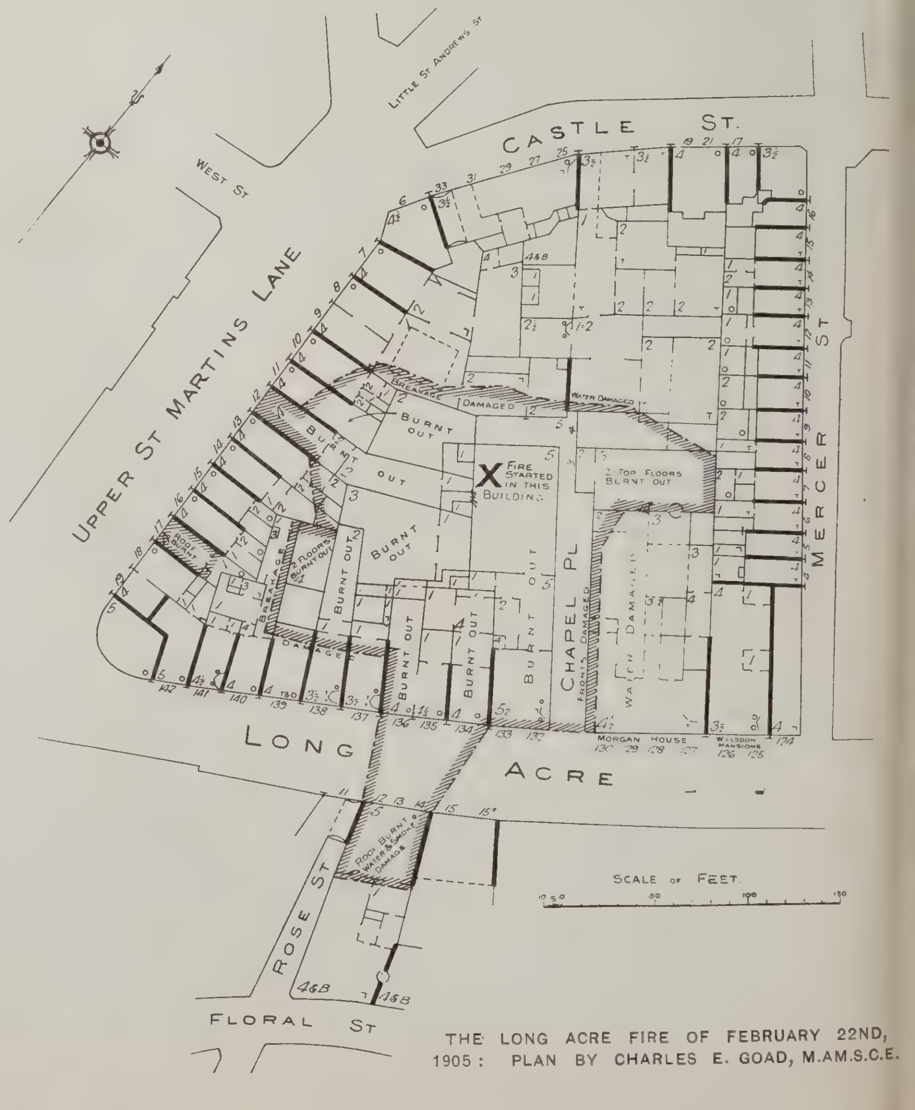
NO example of greater force could have been afforded as to the necessity of revising the Building Act from the fire point of view than the circumstances of the City fire at the City Mills building, Upper Thames Street, in January. Here we have an instance to show how essential it is for such building legislation to be of a retrospective character.

As to the history of the building in question, frequent attempts have been made by the London County Council to reduce the risk of fire in buildings of this kind. We give below an extract from a report the London County Council has decided to send to the Home Secretary on the matter, and we would particularly remark that in the opinion of the London County Council the Bill drafted by the Corporation of the City of London and dealt with elsewhere in this supplement, would not cover a case of this kind.

The L.C.C.'s Earlier Action regarding these Premises.

The County Council Building Act Committee reports as follows:—

On 7th October, 1902, we submitted a report to the following effect:—These premises, which are situated in Upper Thames Street between Wheatsheaf Wharf and Puddle Dock, and about at the rear on the river, consist of basement and ground floors with seven floors over. The seventh floor is about 72ft. above the street level and is occupied by Messrs. J. F. Farwig & Co., as are also the sixth and fifth floors. The fourth and third floors are occupied by Messrs. Spiers & Pond, and are used as a factory and for grocery, packing and despatching, and as a store. The second floor is occupied by Messrs. G. Wright & Co., and is used as an engineer's shop and ironfounders' and hardware store. The lift near the north-east angle of the premises used by Messrs. Spiers & Pond is enclosed on this floor by means of a revolving iron shutter only, and in the event of a fire occurring below, this floor might become involved through the lift. The first floor is occupied by Messrs. Spiers & Pond and is used for composing, letterpress printing, hardware packing, and as a store for hardware, furniture, stationery and glass. The ground floor is occupied by Messrs. J. F. Farwig & Co. and Messrs. Spiers & Pond, the former using the small portion in the north-west angle for an office and showroom, and the latter the whole of the remaining portion for loading and despatching grocery and hardware goods. There is also a loading way and platform on this floor, next the loading way at the northern end, used by Messrs. G. Wright & Co. The basement is occupied by Messrs. Spiers & Pond, and is used for storing wine, packing cases and wood. On the first, ground and basement floors considerable quantities of straw are stored and used in connection with the packing. The numbers of persons employed on the various floors on the occasion of the original survey made by the Council's officers were as



THE LONG ACRE FIRE OF FEBRUARY 22ND, 1905: PLAN BY CHARLES E. GOAD, M.AM.S.C.E.

INTERIOR VIEW, LOOKING TOWARDS LONG ACRE.

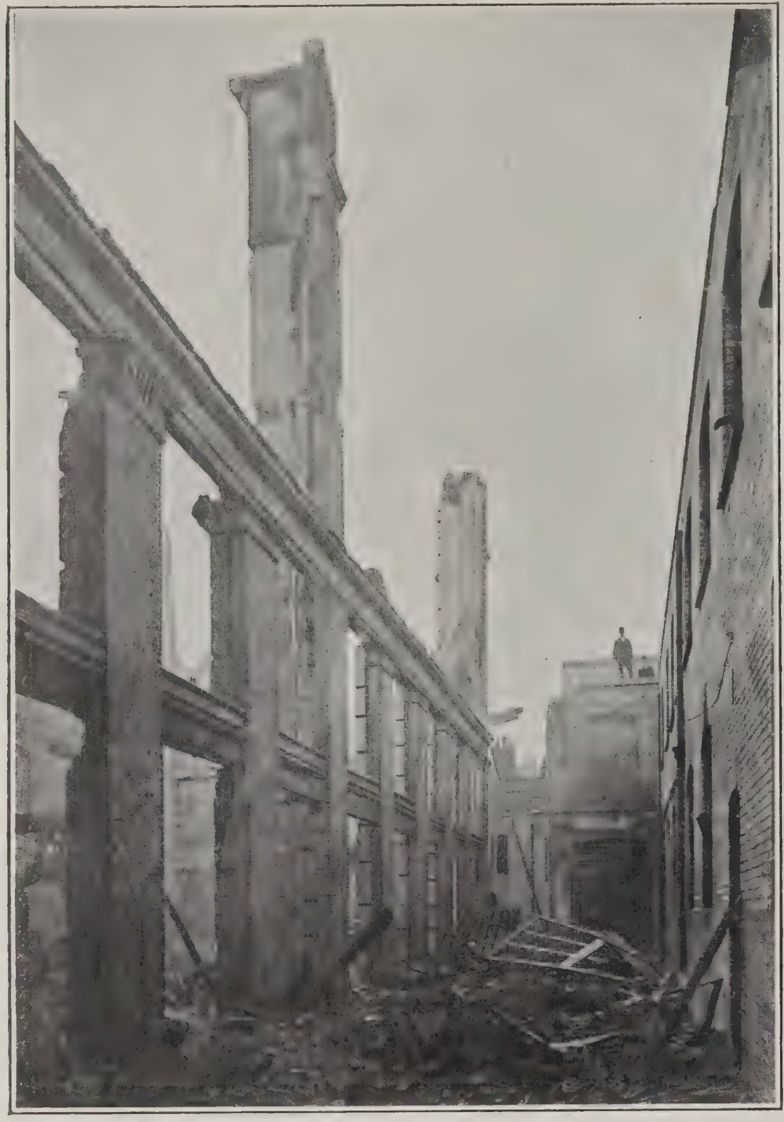
follows:—Seventh floor, 53; sixth floor, 105; fifth floor, 15; fourth floor, 10; third floor, 55; second floor, 8; first floor, 31; ground floor, 77; basement, none employed continuously; total, 354.

A sealed notice was served on the owner of the premises on 13th December, 1900, containing requirements for the provision of a brick enclosed incombustible staircase at the southern end of the building, connected with all floors and with Wheatsheaf Wharf at the ground level by doorways hung with fire-resisting doors, and requirements as to doors, handrails, &c., to the existing staircases at the northern end of the premises. The sealed notice was not complied with, and the matter was referred to arbitration in July, 1901. The award was made on 4th March, 1902, and was to the effect that the premises were used for factory purposes, and were not provided with such means of escape in case of fire for the persons employed therein as could reasonably be required under the circumstances of the case, and, further, that the need of a remedy was very urgent and took precedence of any other consideration; that the second floor was not a factory where upwards of 40 persons were employed, and that, with the exception of certain portions, which were specially excepted, it was leased to Messrs. Wright & Co., only eight males being employed on the floor; that the requirements contained in the Council's sealed notice relating to the construction of an additional staircase could not be reasonably required in the circumstances of the case, as they would involve the owner in a question of trespass on the portion of the premises occupied by Messrs. Wright & Co., but that the provision of a staircase in the position set forth in the Council's sealed notice, starting at the level of the third floor and extending up to the seventh (top) floor and communicating with the intermediate floors between the third and seventh floors, would materially diminish the risk of injury or loss of life in case of fire breaking out in any of the upper floors of the building. The award directed that the notice served by the Council should be amended so as to require the provision of such a staircase, and further, that the Council should pay the owner his costs of and incidental to the reference, and also to bear its own cost and the cost of the award.

On 27th January, 1903, we reported that an amended sealed notice, in accordance with the terms of the award, was accordingly served on Mr. Toller, the owner of the building; but Messrs. Spiers & Pond, the occupiers of a considerable portion of the building, refused to allow him facilities for carrying out the work required by the notice. Mr. Toller therefore applied for an injunction to restrain Messrs. Spiers & Pond from interfering with his workmen, and the case was heard by Mr. Justice Buckley on 11th December, 1902, judgment being given on the 16th. The judgment was to the effect that the umpire was not justified in requiring the Council to serve, and consequently the Council was not justified in serving, a notice requiring the owner to do any works for providing a means of escape for the persons employed in the portion of the building occupied by Messrs. Farwig & Co. as a factory through the portion of the building occupied by Messrs. Spiers & Pond as a factory, and conversely, that the notice could not require the owner to do works in Messrs. Farwig's portion of the building for the benefit of the persons employed in Messrs. Spiers & Pond's factory.

We pointed out that the effect of the judgment appeared to be to make it practically impossible for the Council to deal with any "old" factory premises other than those which were wholly in one occupation and those which were "tenement" factories within the definition contained in the Act, as construed by Mr. Justice Buckley, *i.e.*, premises the whole of which was occupied as factories, the mechanical power for which was supplied from one common source; and that it would be easy for the owner of a factory building, by letting such building to more than one occupier, to nullify the provision of section 14 of the Factory and Workshop Act, 1901. The judgment increased the difficulty, caused

INTERIOR VIEW. LOOKING BACK FROM LONG ACRE



THE LONG ACRE FIRE: VIEW OF CHAPEL PLACE.

by questions of trespass, which the Council had always experienced in the discharge of its duty under the Factory and Workshop Acts with respect to the provision of means of escape in case of fire. As showing the serious nature of this difficulty it was stated that of 106 cases within the City remaining to be dealt with, 26 could not be effectively dealt with owing to questions of trespass, and of these 26 cases 22 were classified as dangerous.

As the Council could not take any further action in the matter, the whole of the facts were communicated to the Home Secretary with an intimation that the Council would in future remit to him all cases with which it was unable to deal effectively under the present law.

Short Description of Building.

The building consists of basement and ground and seven floors over; the floors are in various occupations. The building is about 220ft. in depth from north to south, and there is only one means of escape from each floor, and this is situated at the north end of the building. The escape from the seventh and sixth floors is by a wood staircase of step-ladder construction in the north-west angle of the building, open on the seventh floor, and enclosed with wood partitions on the sixth floor and with brickwork from the sixth floor downwards to the street. There is no communication from the floors below the sixth floor to this staircase, and within the enclosure there is a lift shaft, divided from the stairs by a wooden partition only. A similar staircase enclosed with brick walls at the north-east angle of the premises affords escape from the fifth and floors below into the street.

The number of persons employed is 354, and the number above the ground floor is 277.

THE L.C.C.'S OPINION.

Danger to Persons employed in Building.

From a consideration of the description of the building it will be evident that the danger from fire to persons employed in the building is very great. The two top floors are occupied by persons employed in making packing-cases, and there are numerous unprotected gas stoves for heating soldering-irons. On the other floors there are great quantities of inflammable materials, especially on the first, ground and basement floors, where straw is stored for use in connection with packing and distributing goods from Messrs. Spiers & Pond's grocery stores. There is only one means of escape from each floor, and that of unsatisfactory construction; and in the event of a fire occurring on any floor people working at the end of the building remote from the staircase would have to traverse 220ft. through flames and smoke across a floor covered with obstructions. There would be no escape for a person on the upper floors if the staircase became involved, and even if access to the roof could be obtained there would be no chance of escape except by jumping from a height of about 90ft. into the street or the River Thames. It will thus be seen that a fire occurring in such a building when the work-people were on the premises would almost certainly be attended with serious loss of life.

FIRE PREVENTIVE LEGISLATION FOR LONDON.

As far as fire protection in the Metropolis is concerned, the present session of Parliament should be of momentous import to the Metropolis, for it should bring with it the consideration of the Building Act Amendment Bill of the London County Council, which is probably one of the most far-reaching, beneficial measures of its kind ever proposed in the interests of safety of life and property. As far as the fire-protective clauses are concerned, we are in full sympathy with the aspirations of the London County Council in this direction, even if we differ with them as to some of the proposed clauses: the divergence of opinion is more in the direction of wording and technicalities, and particularly more in the direction of the proposed methods of administration, than in respect to any question of structural principle involved.

Taken as a whole, as far as fire protection is concerned the Bill is obviously a good one, and, further, in the interests of the future development of the Metropolis. But we do not agree with the Council's wishes in the direction of centralization, *i.e.*, with such clauses as making it compulsory for every important building to be referred to Spring Gardens as far as its fire protective aspect is concerned. We should prefer a clear code on these points to be administered by the district surveyors. We fear that if this tendency for centralization be pursued it may cause the wreckage of the Bill, and we thus strongly advocate a clear definition of requirements in matters of detail and the retention of the present machinery of the district surveyor's offices for dealing with these fire-protective points.

Only in the case of cubic contents do we think the Council have a just claim to require reference to Spring Gardens as heretofore. As to this question of cubic contents, whilst we mention it we are under the impression that some error must have occurred in the drafting out of the Bill, for we are afraid the cubic contents that will be permissable under the proposed enactment are far in excess of what should be reasonably permitted in the Metropolis as a matter of principle.

We do not much care for some of the points in the schedule regarding fire-resisting materials, which we think require modification, but speaking generally, as indicated before, as far as the fire-protective clauses are concerned we hope the proposed Bill will become law.

We are somewhat astounded at the intensely ignorant and interested opposition to the Bill manifested in the City area, and our astonishment is greater when we remark a small Bill which has been quietly lodged on behalf of the Corporation of the City of London in which powers quite as drastic, if not more drastic in certain directions, are desired by that body. We do not think the Lord Mayor was well advised to preside at the recent meeting, and that however excellently "stage-managed" the gathering in question did no credit to civic diplomacy.

In this supplement we do not wish to go further into detail regarding the proposed Bill of the London County Council, for the subject was ably covered by a contributor to our last supplement of February. Regarding the Corporation's wishes, however, we present in full those clauses which describe what the City proposes doing:—

> 4. Subject to the provisions of this Act every existing house or building within the City shall within a period of one year from the first of January one thousand nine hundred and six be provided with a stairway or other suitable means of communication from the uppermost floor to the roof thereof and from the roof thereof to the roof of one of the buildings adjoining thereto or other adequate means of escape from fire to the satisfaction of the Corporation signified by the certificate of their officer

duly authorised in that behalf. Such stairways or other suitable means of communication or other adequate means of escape from fire shall be of a permanent character and be constructed and kept and used solely as a means of escape from fire and shall with free and proper means of access and marks of direction thereto be provided and maintained in good condition and repair and free from all obstructions by and at the expense of the owner of such building to the satisfaction of the Corporation signified as aforesaid.

5. Subject to the provisions of this Act the Corporation may serve notice upon the owner of any house or building in and upon which no such stairways or other suitable means of communication or other adequate means of escape from fire with free access thereto as aforesaid exist on the first of January one thousand nine hundred and seven requiring him to provide the same and if within six months of service of such notice he fails to comply with such requirement the Corporation may make complaint thereof before a petty sessional court who shall thereupon issue a summons requiring such owner to appear to answer such complaint and if the complaint is proved to the satisfaction of the Court the Court may make an order in writing requiring such owner to provide such stairways or other suitable means of communication or other adequate means of escape from fire with free access thereto as aforesaid or in case he fails to comply with such order within such time as the Court prescribes empowering the Corporation to provide and erect the same and recover the expense of so doing in manner hereinafter provided from the owner so in default together with any compensation payable under section 7 of this Act or the costs of any arbitration payable under that section and the expense of any such complaint and order as aforesaid.

6. The Corporation shall for the purposes of this Act and for carrying the several provisions therein contained into full and complete effect have full power and authority to enter or to order and direct their officers or contractors employed by them at all reasonable hours in the daytime to enter into and upon any house or building within the City and into and upon the land on which any house or building is built without being liable to any action at law or suit in equity or any other legal proceedings or molestation whatever for or on account of such entry or the works done or to be done in pursuance of this Act.

7. The owner of any house or building or in case of his default the Corporation may affix or secure to the party-wall roof or other suitable part of any adjoining house or building any stairway or other suitable means of communication or other adequate means of escape from fire erected in compliance with the provisions of this Act. Provided that the owner or the Corporation as the case may be shall make compensation to any persons sustaining injury by reason of negligence in the affixing or securing of any such stairway or other suitable means of communication or other adequate means of escape from fire to any house or building the amount of such compensation to be determined in default of agreement by arbitration under the Arbitration Act 1889.

8. Any person who deems himself aggrieved by any conviction or order made by a court of summary jurisdiction on determining any information or complaint under this Act may appeal therefrom to a Court of Quarter Sessions.

9. This Act shall not extend or apply to factories or workshops as defined by the Factory and Workshop Act 1901 nor to any new building as defined by section 5 (subsection 6) of the London Building Act 1894 exceeding sixty feet in height.

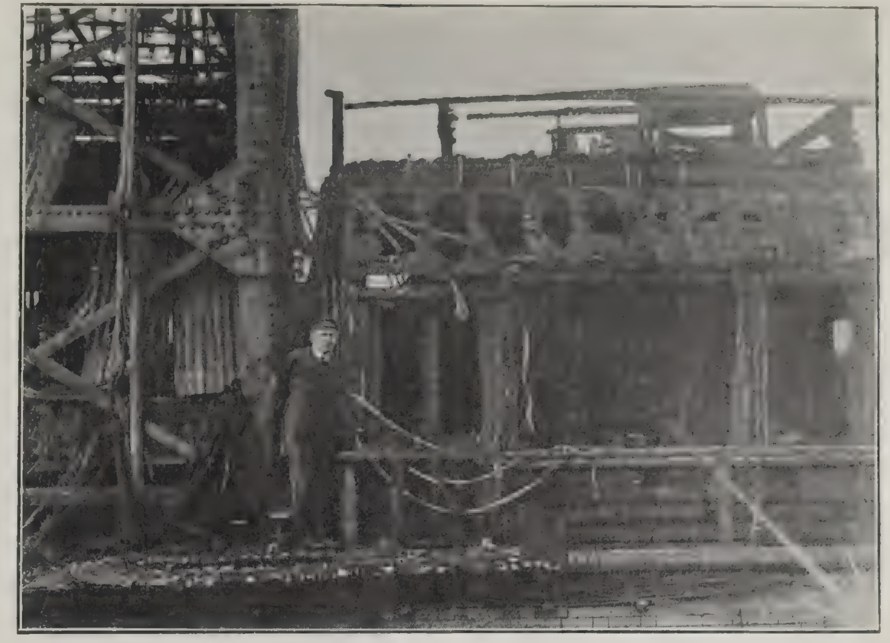
10. Any owner failing to maintain in good condition and repair and free from obstruction the means of escape from fire erected in pursuance of this Act or otherwise shall be liable to a penalty of five pounds and to a daily penalty of two pounds for every day on which the offence is continued after conviction therefor.

11. Offences against this Act and penalties costs and expenses imposed or recoverable under this Act may be prosecuted and recovered in a summary manner. Provided that costs or expenses except such as are recoverable along with a penalty shall not be recovered as penalties but may be recovered summarily as civil debts.

12. All penalties recovered under this Act shall be paid to the Corporation.

The International Fire Service Council.—We understand that the next meeting of the Executive of the International Fire Service Council is to be held in the month of April.

The St. Petersburg Fire Brigade.—We understand from a reliable source that the long-needed reorganization of the St. Petersburg Fire Brigade is to be taken in hand, and that in setting out the principles on which this force is to be henceforth managed the fire-preventive aspect is to have due consideration, as also matters appertaining to the co-operation of the fire service in fire-survey work. The problem of reorganizing the St. Petersburg Fire Brigade has been put into the hands of Chief Officer Reichel, of the Hanover Fire Brigade, whose great services in the introduction of modern methods on the Continent we frequently have had occasion to refer to, and who, as we have indicated in an earlier supplement, is the first fire-brigade officer to hold a chair on fire-protection at a royal technical college in Germany. Chief Officer Reichel is at present at St. Petersburg, engaged on this special duty.



TELEPHONE STANDARD AFTER THE FIRE OF FEBRUARY 28TH.

FIRES AT TELEPHONE EXCHANGES.

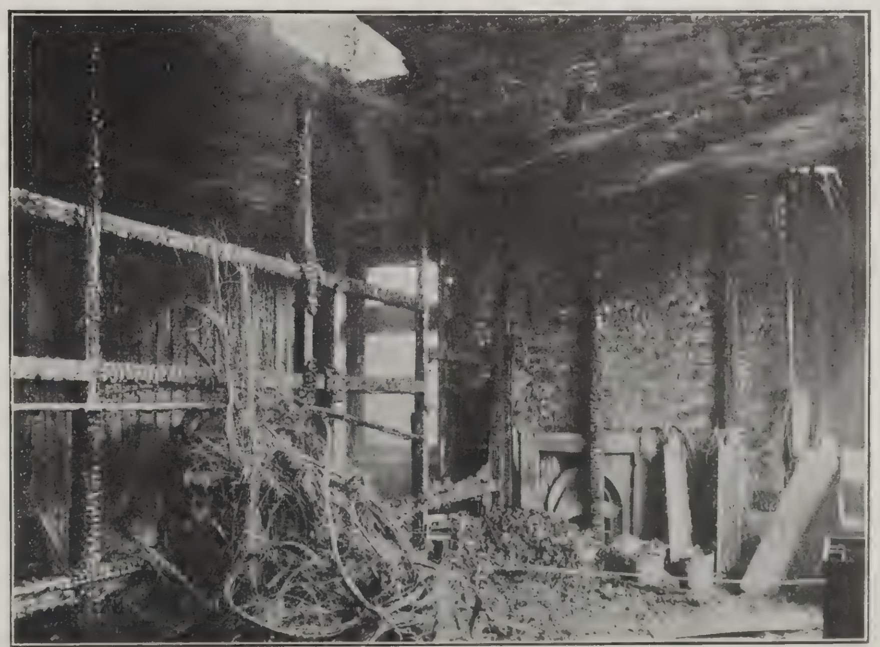
ATTENTION needs to be called to the increasing hazard of fire occasioned by the telephone service, a hazard which does not only refer to the actual premises of such exchanges but also refers to the property over which there are standards carrying the telephone wires. There have already this year been two very serious fires in connection with the National Telephone Co.'s service, and in each case, quite apart from the question of fire risk to the buildings and their occupants, there has been the disorganization of the telephone business, which has been most inconvenient to the subscribers.

We certainly think that the National Telephone Co.'s engineers would do well to accord the question of fire risk some additional forethought and care, for such accidents as have resulted from these fires must necessarily be due to neglect that can be overcome by careful supervision and painstaking management.

The National Telephone Co, it is true, has not many more years to live, for it will not be long before its service has been merged into the Post Office service, but if these fires continue the shareholders of the company will have to make up their minds to take a very different view of the value of the plant that has been constantly subject to fires, as distinct from a plant in which the average number of fires is low; for it should be remembered that as far as Government property is concerned, it is never insured; the Government simply stands the risk, and the Treasury will not be inclined to pay a high price for an installation that is not a reasonably safe one.

Of the two fires that have occurred, the one that took place in the early morning of February 28th opened up a new vista as to the difficulties the London Fire Brigade has to contend with under modern electrical conditions; for this fire, which occurred so high above street-level, was of a unique character.

Two photographs presented on this page illustrate the character of the second fire and the wreckage wrought on that occasion. They show the main standard affected and the chamber below it.



TELEPHONE CHAMBER AFTER THE FIRE OF FEBRUARY 28TH.

FERRO-CONCRETE.

From the Fire point of View.

WE are indebted to our American contemporary the "Fireproof Magazine" for the courteous loan of some excellent illustrations of details relating to the effect of fire at the Baltimore conflagration upon ferro-concrete. It is not with the object of decrying concrete or ferro-concrete that we publish these illustrations, but merely to elucidate an earlier argument of ours, and also to elucidate the valuable contribution by the well-known insurance surveyor, Mr. James Sheppard, A.I.E.E., in our first supplement as to the necessity of the metal-work in ferro-concrete (rods, wires or bars, as the case may be) being duly covered by a sufficient thickness of concrete to prevent its being affected by fire. In other words, we simply present these illustrations to indicate in what direction existing ferro-concrete systems must be improved in order to attain that quality of fire-resistance which is essential if the systems are to become popular in this country.

In France, the home of the ferro-concrete systems, fire prevention and fire-resisting qualities rarely receive due consideration, and it is only in the far future that we anticipate that that attention will be given to this aspect of constructional work by the public authorities of France.

But questions of fire prevention do receive consideration in this country, and it speaks well for the consideration of technical details on the part of the London County Council that floors of this type will be tabooed in the Metropolis if the metal-work is not protected by at least 2ins. of concrete, and this restriction will be one of the most beneficial factors of the proposed Building Act amendments when they become law. Metal-work everywhere will have to be protected in this manner, and this will include the metal-work in ferro-concrete floors.

Our illustrations are of the Fidelity and Guarantee Building of Baltimore. This building was a four-storey structure, comprising girders, posts and floors in armoured concrete; the bays of the floors span about 10ft. each. The lower portions of this building were uninjured, and the upper portions had to bear the brunt of a considerable amount of fire; it is thus from the upper floors that we present the illustrations.

Of course the Baltimore fire did not present anything that was new to those conversant with the subject in this country. It was generally well known that where metal-work was not properly protected in ferro-concrete floors, damage must be done.

The test on a Swiss concrete floor, and illustrated in our first "supplement," clearly showed what would happen if the metal-work was not properly protected. It is however, always interesting to have such illustrations as these herewith to prove a principle, taken from actual fires, and we trust that the lesson presented at Baltimore in such a forcible manner will at least convince the French ferro-concrete manufacturers who are opening up business in this country that it is futile to put their wires, bars and rods close to the soffit of the floors if they propose to make any considerable progress on British territory.

Given the due protection of 2ins., we see no reason why these ferro-concrete floors should not withstand a very considerable amount of fire and water, and they should, in fact, be able to attain classification as "full protective floors" under the testing standards. But the question of the protection of the metal-work is an essential one, and to attempt building floors where it is not so protected is puerile from the fire point of view.

It is to be hoped that the insurance companies, who have very great power in the direction of ware and dock property, will insist on this protection being afforded, and it is also to be hoped that some of the more progressive firms interested in the subject will boldly adopt the necessary policy of protecting steelwork and prove officially what we here indicate. We believe excellent results will be thereby obtainable.

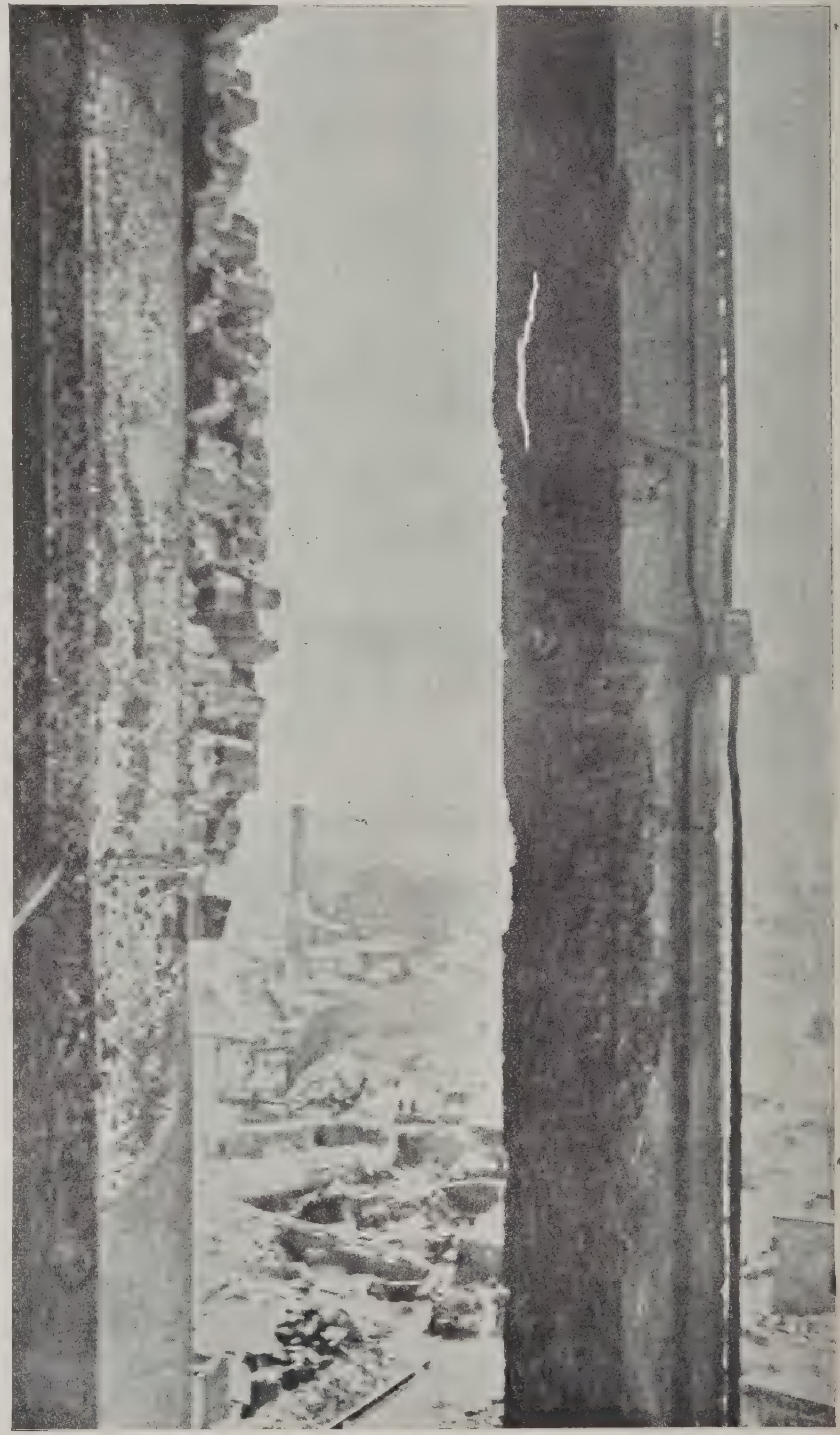
The National Fire Brigades Union had its annual Council meeting on the 24th February, when a considerable amount of useful business was transacted. Arrangements have been made by which the Union will hold its tournament in the Crystal Palace grounds some time in June. The Duke of Marlborough will preside at the Union's annual banquet, probably towards the end of this month.

FIRE TESTS.

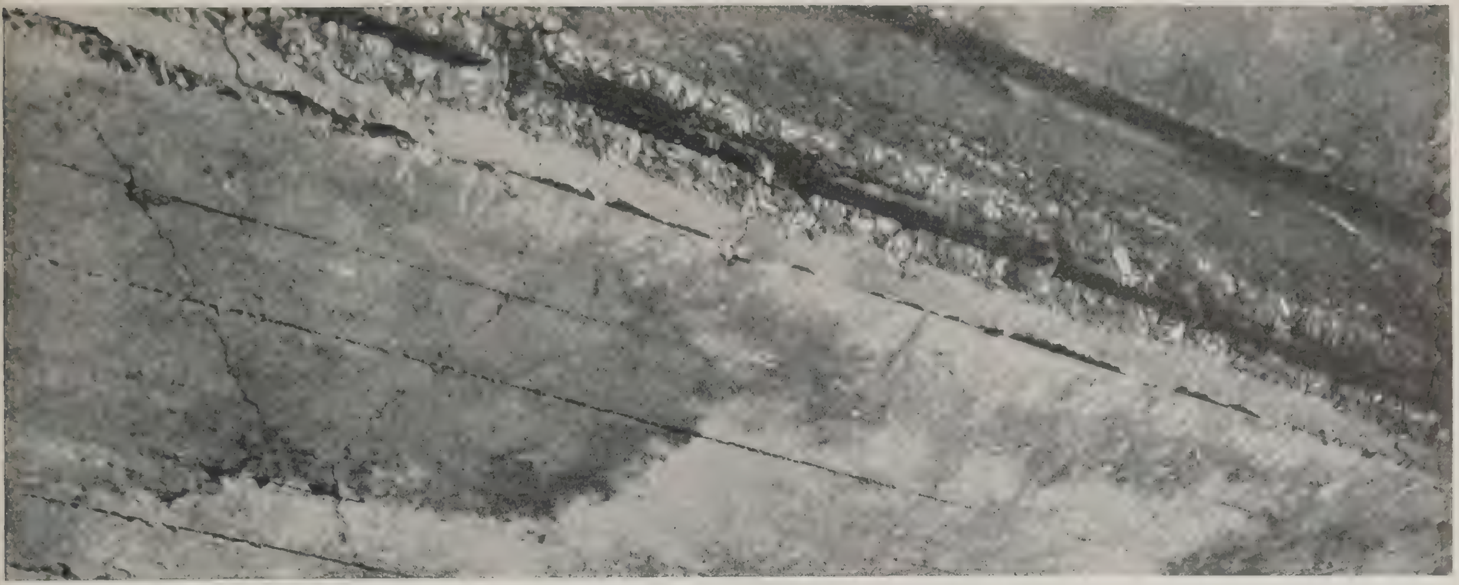
OFFICIAL REPORT ON ELECTRO-GLAZING.

IT is well known that electro-glazing affords considerable protection against fire, and we believe the British Luxfer Prism Syndicate were one of the first to avail themselves of the British Fire Prevention Committee's tests in 1899, to prove their *bonâ fides* and show that electro-glazing really did what they intended.

We believe that no less than three tests were undertaken at that time with casements and skylights having electro-glazing, and it was found that this method of glazing could be relied upon to withstand fire for quite half an hour. At that time both casements and skylights were tested in somewhat large dimensions, each sheet of electro-glazing, i



DETAIL OF FERRO-CONCRETE POST IN FIDELITY AND GUARANTEE BUILDING, BALTIMORE.



UNDERSIDE OF FOURTH-STOREY CEILING.

we recollect rightly, measuring about 4ft. by 3ft.

It has, however, been obvious to all interested in the subject that in order to insure greater efficiency, it is advisable to limit the size of each sheet of such glazing, so as to avoid bulging and buckling, and both the insurance companies recent rules, and the Building Act Amendments Bill, seem to indicate that the maximum superficial area of any one sheet for fire-resisting purposes should be 4ft. super., *i.e.*, that a window should be divided up into lights of not greater superficial area than 4ft.

The company has now tried, in a very progressive manner, to show what their glazing would do under these new and important conditions, and they have been rewarded for their spirited policy by getting through their test in a most remarkable manner, withstanding a very severe fire ranging up to and over 1,500 degs. Fahr., for as much as forty-five minutes, and in respect to none of the lights tested did the fire or smoke penetrate the glazing. Water from a steam fire engine was also applied through a $\frac{3}{4}$in. nozzle, and did not break down the glazing.

We print below the official "object" and "summary" of the report of the British Fire Prevention Committee, which has just been issued as Red Book No. 91, and is obtainable at the Committee's offices.

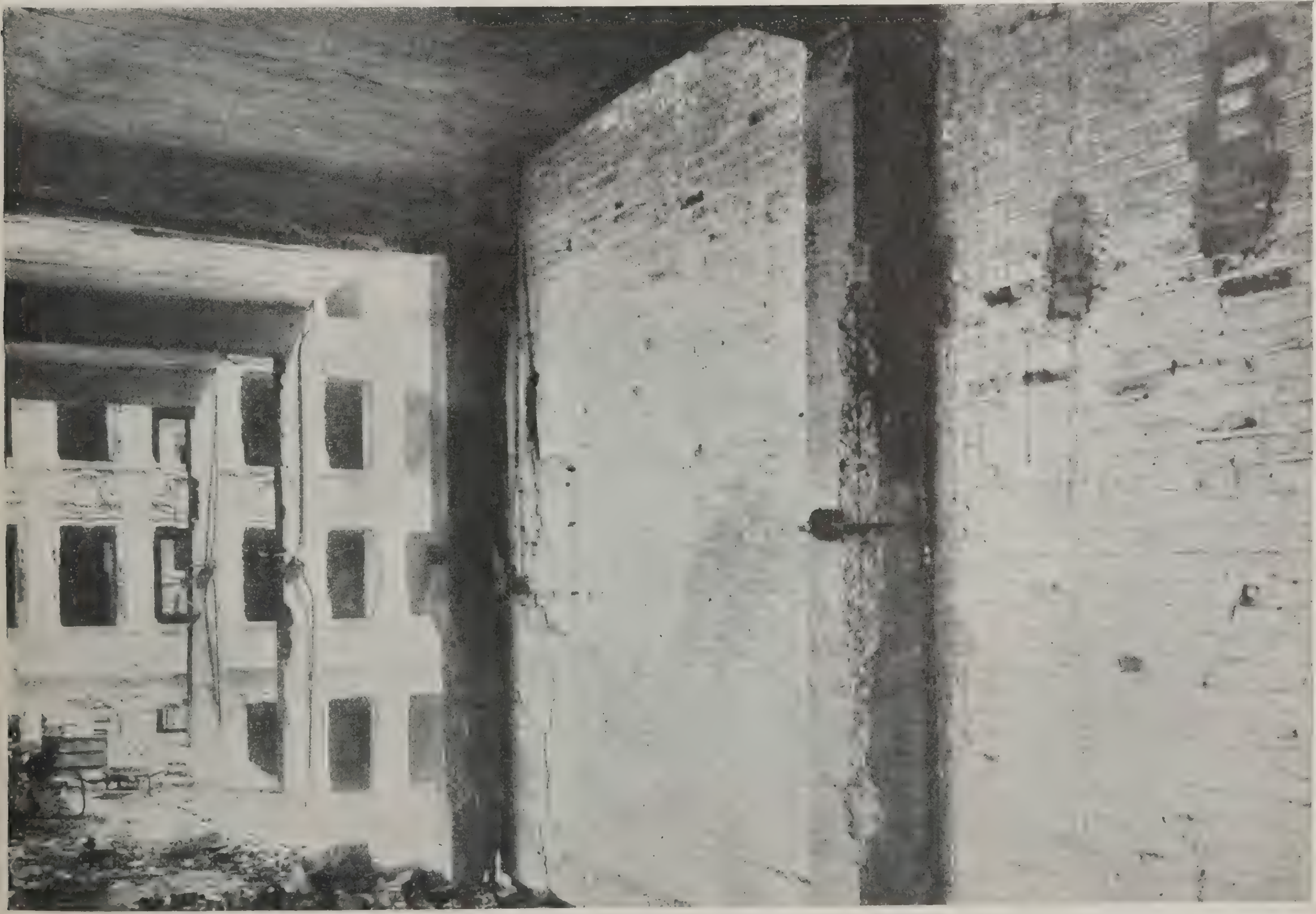
Object of Test.

To record the effect of a fire of three-quarters of an hour's duration at a temperature gradually increasing to 1,500 degs. Fahr. (815·5 degs. C.), but not to exceed 1,550 degs. Fahr. (843·3 C.), followed by the application of water for two minutes.

NOTE.—The lights, six in number, were to be in three pairs fitted in two teak frames and one steel frame respectively, each pair of lights being separated by transoms. The electro-glazing was to be partly in squares of 4in. by 4in. (·1016 m. by ·1016 m.), partly in diamond and fancy patterns.

Each light was to measure 2ft. by 2ft. (0·61 m. by 0·61 m.).

NOTE.—The frames are described as Nos. 1, 2 and 3; Nos. 1 and 3 being teak and No. 2 steel.



FERRO-CONCRETE COLUMNS IN FOURTH (OR TOP) STOREY OF FIDELITY AND GUARANTEE BUILDING, BALTIMORE.

Summary of Effect.

The squares of electro-glazing in each of the lights commenced to crack immediately after the gas was lit and other squares continued cracking during the test.

In fifteen minutes the glazing in the two teak frames commenced bulging, one (No. 1) towards the fire, and the other (No. 3) from the fire; this bulging increased during the test from ¼in. (·0063 m.) to ½in. (·0127 m.).

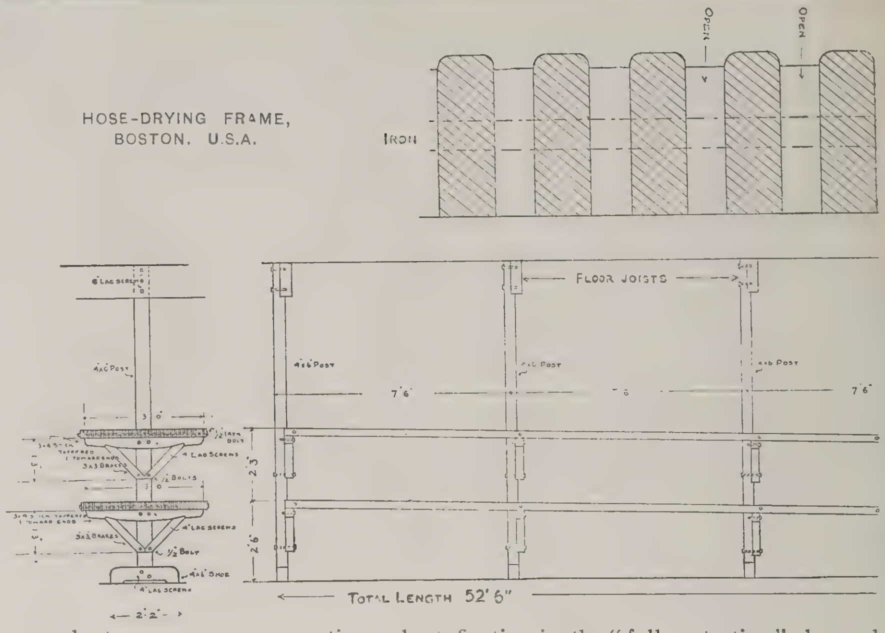
The teak frame (No. 1) which was set nearly flush on the fire side was burning freely; the burning subsequently decreased, but was renewed at twenty-one minutes. In forty minutes the teak transom of this frame was aglow on the side away from the fire.

The glass was not displaced from its electro-glazing in any of the lights.

On the application of water at forty-five minutes, the whole of the glazing was covered with small hair cracks, presenting a frosted appearance, but was not displaced.

There were indications that fire had passed between the glazing and the wood frames.

The fire did not pass through the glazing.


HOSE-DRYING FRAME, BOSTON. U.S.A.

AN AUTOMATIC FIRE-ALARM.

(B.F.P.C. Testing Operations of February 21st and 22nd.)

We understand that a test of considerable interest has been undertaken at the British Fire Prevention Committee's testing station with an automatic fire-alarm system by a Danish firm, which, it is anticipated, will overcome the grave defect at present existing in fire-alarm systems, namely, that of their frequently giving false alarms.

We understand the test extended over two afternoons, and on the second afternoon, the Committee were honoured by the presence of the Danish Minister, Mons. de Bille, accompanied by the Secretary of Legation and the Danish Consul, who witnessed the experiments that were being made with their countrymen's installation. It speaks highly for the interest accorded by Foreign Governments in the development of inventions by their citizens, that the Danish Minister should have attended this demonstration. We cannot recollect of ever having heard on any occasion that a British Minister, or even a Consul, has taken the trouble to attend an Englishman's demonstration of work in a foreign country, even on such great questions affecting our industries as the trial of ordnance and the like.

The tests, we have been given to understand, comprised a series of three laboratory tests, and three practical tests, supplemented by some general experiments. They took place on February 21st and 22nd, and there was a considerable attendance of representatives from public and municipal departments. It is anticipated that the official report will appear early in April. The system under review is known as the "Autopyrophon" of Copenhagen.

FIRE-RESISTING PARTITIONS AND WIRE GLASS.

(B.F.P.C. Testing Operations of March 8th.)

On Wednesday, March 8th, the British Fire Prevention Committee's testing station was the scene of a very important series of tests with proprietary articles, the Executive having arranged these tests to be undertaken as a series so as to enable the provincial members to attend and see a whole series of tests, who would scarcely make a special journey to town for witnessing a single test. This idea, which found a considerable favour with the provincial membership of the Committee, also had the great advantage of economy of time to those interested spectators who wished to just obtain an insight into the conduct of certain materials under fire and yet cannot afford the time to attend throughout the period of investigation. The tests, which commenced at 10.30 a.m., ran continuously until 6 p.m., but a visitor attending between 2 p.m. and 4 p.m. was able to see the ending of one important partition test, the whole of a test with wired glass and the commencement of a test with a thin partition, besides some experimental private tests with sprinklers and automatic alarms.

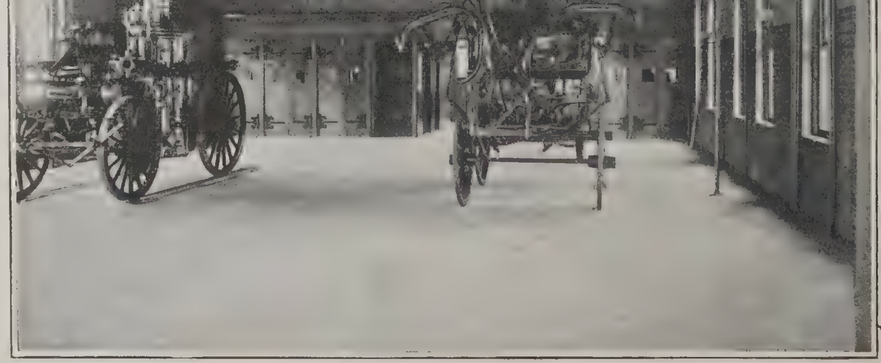
The first subject under official investigation on this occasion was a 3in. partition and a 9in. wall of asbestic bricks, manufactured by the Asbestic Brick and Tile Company, Ltd., who put these forward for a four hours' test in order to enable them to attain classification under the "full protective" class, which comprises a test of four hours of fire, ranging up to 1,800 degs. Fahr. and followed by the application of water from a steam fire engine for five minutes.

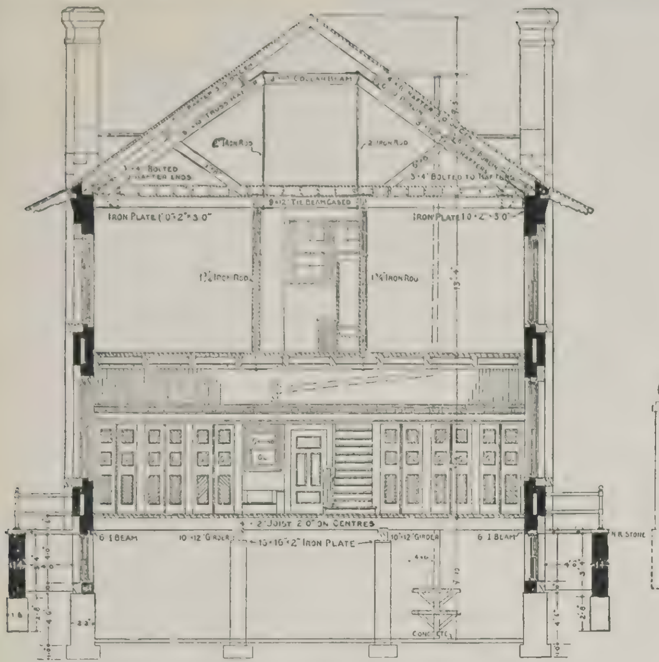
The second test was a test with wire glazing by Messrs. Pilkington Brothers, varieties of wired glazing, both polished and unpolished, being put forward for investigation, in various casements, the object being that these should attain the "temporary protective" class, which requires that they should stand a test of forty-five minutes up to 1,500 degs. Fahr., followed by the application of water for two minutes.

The third test was with a partition by the Adamant Co., measuring 2½ins. thick. This partition was also intended to obtain classification in the "full protective" class, which in the case of a partition of 2½ins. and under, means that it has to withstand a 2½ hours fire test up to at least 1,800 degs. Fahr. followed by the application of water for two minutes. It may thus be seen from the above that whilst the thicker partitions have to withstand fire for four hours, followed by the application of water for five minutes, the thinner one can obtain the same classification under less severe conditions, which practically means that a very substantial premium is set upon economy of space and a handicap on partitions that are not much thinner than ordinary brickwork.

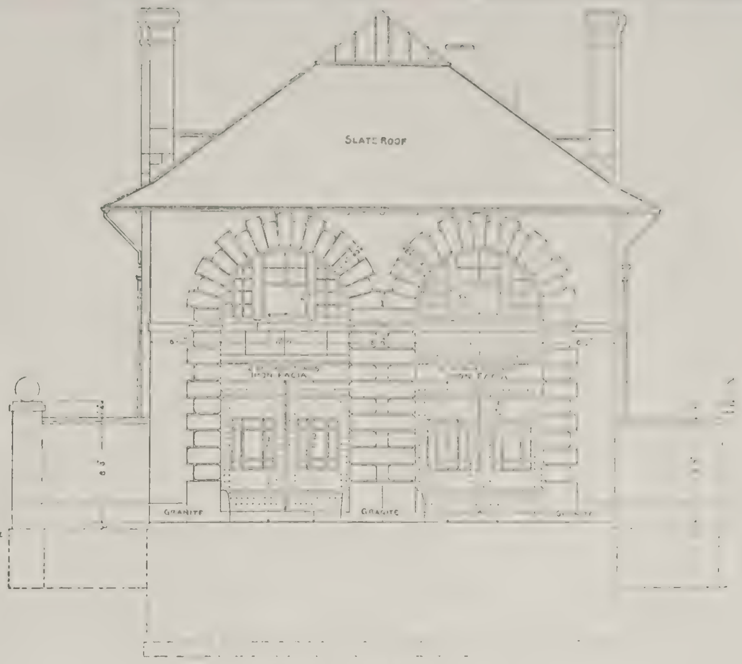
These tests were attended by a stream of members coming from all parts of the country throughout the day, a number of Government departments and various official bodies were also represented during either the whole or part of the testing operations. During the afternoon, some private tests were also conducted with sprinkler heads with a view of showing how these tests were conducted by the Committee and in continuation of a series of tests with sprinkler heads which have been undertaken this session. The Danish fire alarm system referred to above was also under trial on continuation of some tests undertaken last month.

Amongst those present on this occasion were:—Mr. Redford, of the Home Office


INTERIOR VIEW OF ENGINE-HOUSE DISTRICT FIRE STATION. BOSTON U.S.A.

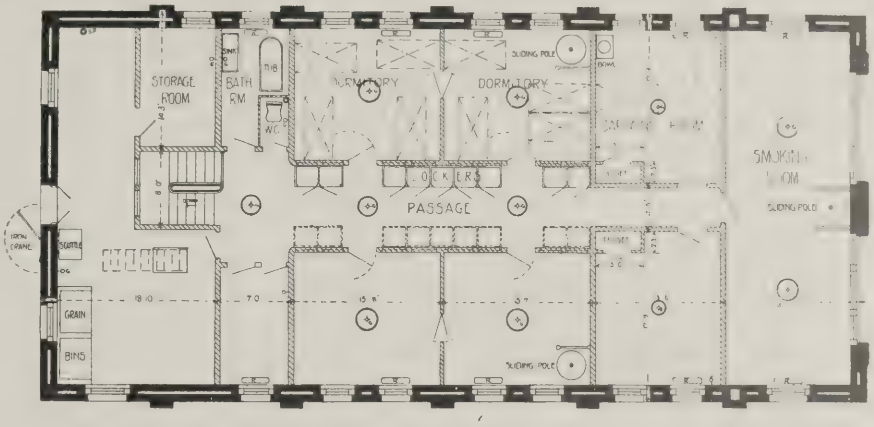


CROSS-SECTION.

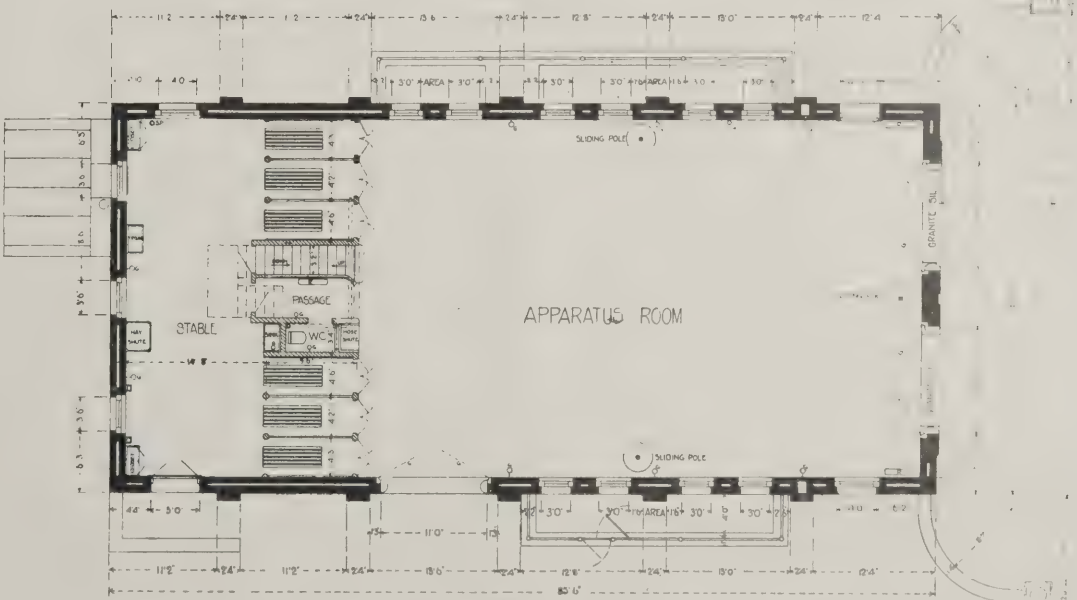


FRONT ELEVATION.

Factory Department; Mr. Gavey, C.B., of the General Post Office, accompanied by two assistant engineers; the engineer from H.M. Office of Works; the Danish Consul-General, and a number of officials from county councils, corporations and insurance companies.—The tests were conducted by special sub-committees, over which Mr. Dyer, Mr. Max Clarke and Mr. Marsland respectively presided; Mr. James Shepherd supervising the private tests.



SECOND FLOOR PLAN



FIRST FLOOR PLAN

WEST ROXBURG DISTRICT FIRE STATION, BOSTON, U.S.A. JOHN A. FOX, ARCHITECT.

DISTRICT FIRE STATION, BOSTON, U.S.A.

A CHARACTERISTIC feature of the American fire stations is the comparatively narrow frontage accorded them, and in many instances only one carriage door is available, through which the appliances are driven one after the other.

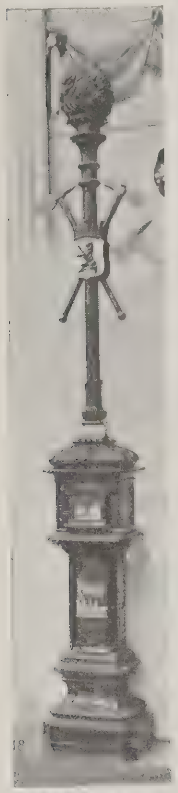
At Boston, U.S.A., the district station illustrated in this supplement, however, has two engine-house doorways, and the two appliances stand side by side, with plenty of space between them, the frontage of the building occupying 40ft. As a two-appliance station the example shown is a model one for American purposes, and the position of the main staircase, the stables and the three sliding poles should be specially noted. The bedrooms, smoking-room and offices on the first floor also claim attention on account of their compact arrangement and the excellent arrangement of the men's lockers.

As to the exterior, it has architectural pretensions, and suitably indicates the public character of the building. A detail claiming consideration is the hose-drying frame in the basement, which runs from front to back, whereby no hose tower is required. Mr. John A. Fox was the architect.

Chief Officer Giersberg, of the Berlin Royal Police Fire Brigade, died recently. "Engineering" says of him that he was well known throughout the continent of Europe and also in this country, which he twice visited. He was a primary mover in the evolution of the subject of fire protection in Germany and German-speaking countries, not, perhaps, so much owing to the introduction of modern appliances in his own brigade as by the organization of the very excellent Berlin Fire Exhibition of 1901 and the International Fire Congress of Berlin of that year. Of his writings, which are numerous, a volume dealing with the state of the fire service in Europe at the beginning of this century deserves particular prominence. He was a member of the International Fire Service Council, and an honorary member of both the British Fire Prevention Committee and the National Fire Brigades' Union. Chief Officer Giersberg had the opportunity of frequently being of service to Foreign Governments, and thus, besides a number of high distinctions, he was the recipient of numerous orders and medals from the Prussian and other German Governments; he held a number of distinctions from other countries.

A FOREIGN "FIRE-CALL POINT."

WE are illustrating a photograph of one of the new fire-call points which are being put up in Berlin, the introduction of which was one of the latest improvements brought about by the deceased fire chief, Giersberg. This fire-call point is certainly a most recognizable feature in the Berlin streets, and at night the light at the top is of sufficiently distinctive character as to be easily distinguished from the other lights common to public thoroughfares. These fire-call points are certainly a great improvement on the ugly standards generally to be found in this country, and we also think it is an improvement to attach the actual lamp standard to the call-point, instead of placing the call-point in proximity to a lamp-post. Seeing that red lamps are being constantly used for other purposes than the indication of fire-stations and fire-call points, there is certainly something very valuable in the idea of giving the light in question a peculiar shape and tint.



STREET FIRE-ALARM POSTS AT BERLIN.

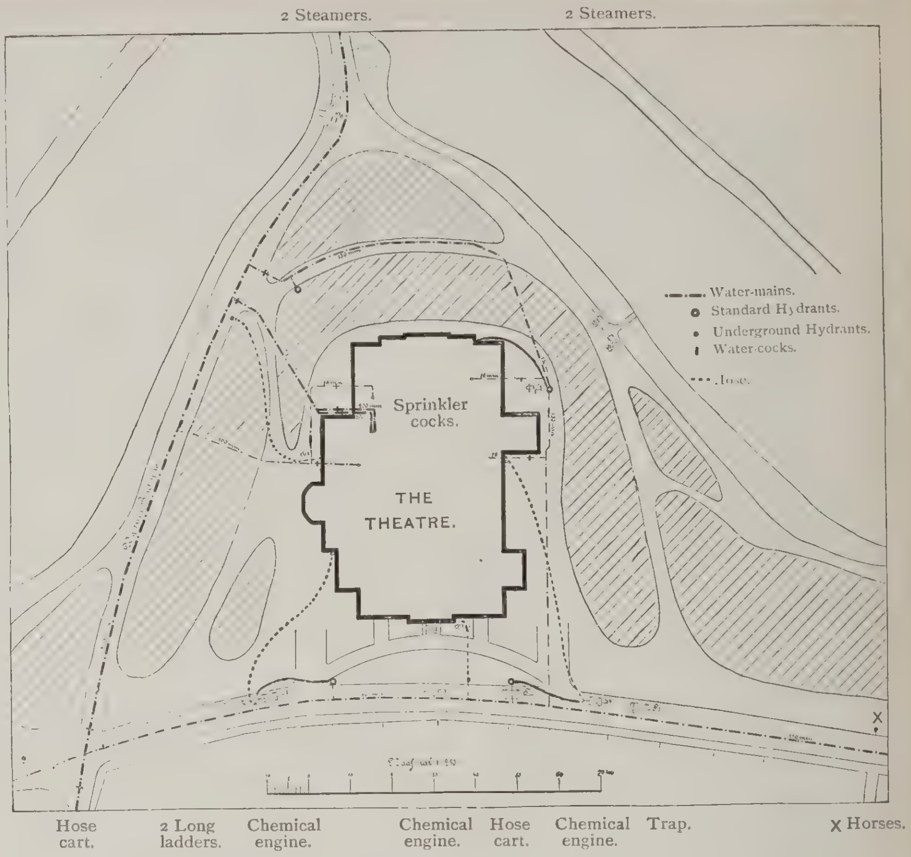
The detail of the design was from working drawings provided by the city architect of Berlin.

MODERN FIRE APPLIANCES AT PARIS.

IT has been our rule, as far as possible, to illustrate some modern fire appliance in each of our supplements, having regard to the fact that so many country architects and borough surveyors are nowadays either directly or indirectly associated with the fire service of the provinces. In this supplement we are illustrating an appliance from the Paris Fire Brigade which is a self-propelled chemical fire-engine. The Paris Fire Brigade, it should be added, is a military institution, known as the Fire Brigade Regiment, which is a unit of the army. Its principal technical officer is Major Cordier, who is primarily responsible for matters of equipment.

Mr. Pritchett, F.R.I.B.A., F.S.I., C.O. London Fire Brigade, has been accorded a seat on the Executive of the British Fire Prevention Committee. He was a member of the Special Fire Commission that visited Central Europe.

A Magazine's interest in Fire Protection.—The "National Review" of last month publishes an article on protection against fire, with particular reference to the irredeemable loss of historical buildings and historical relics, and the series of country-house fires that have been taking place during the last eighteen months. This increase is mainly ascribed to the wanton neglect or apathy of owners of country houses in matters of fire protection, and the fact that they do not realize their duty in retaining for the nation such highly important architectural and archæological monuments as these country houses are. It is indeed a sign of the times to find a first-class magazine taking up the subject seriously, and it is much to the credit of the editor to accord attention to the matter.

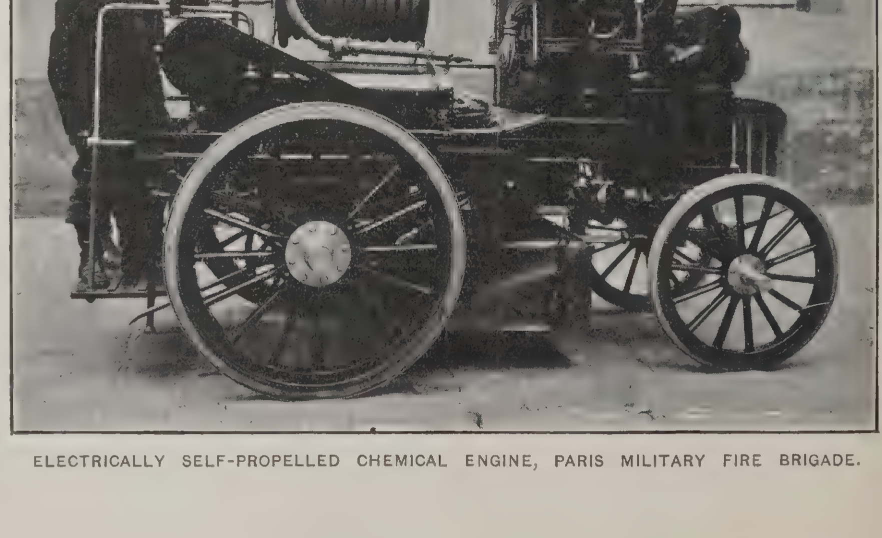


THEATRE SAFETY.

REVERTING to questions of theatre safety, we have always advocated that it is a matter of the utmost importance that fire brigades should be thoroughly conversant with the peculiarities of the theatres in their district. As a matter of fact, it would be well if the primary principles of how to deal with specific theatres in given areas were thought out and made subject to some kind of tactical exercise, as, for instance, the war game as played in the Army.

A step in this direction has been taken by Chief Officer Dittman, of Bremen, who has schemed out various methods of handling various kinds of fires that might occur at the principal theatres in his city; and as we think a plan indicating the possible tactics at a theatre fire to be well deserving of attention, we present, by his courtesy, one of the plans drawn out to serve as a general basis for a tactical or actual attack upon a fire that has arisen, together with the proposed concentration of the brigade in the earlier stages of the fire and the points of vantage in which the first arriving engines should be placed, the amount of hose required, &c.

It is noticeable that in the scheme presented the first steam fire engines are concentrated at the back, *i.e.*, stage side of the building, and the escapes in front of the main entrance.



ELECTRICALLY SELF-PROPELLED CHEMICAL ENGINE, PARIS MILITARY FIRE BRIGADE.

THE

BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

March 22, 1905. Vol. 21, No. 528. 6, Great New Street, Fetter Lane, E.C.

Summary.

Architects' assistants from twenty-four to thirty years of age are wanted for Chicago. (Page 157.)

The London Building Acts Amendment Bill has been dropped, with the exception of the fire clauses. (Page 158.)

Students of the modelling school at the Royal College of Art are to be allowed to submit sketches for four of the statues required on the South Kensington Museum extension. (Page 157.)

For the Ritz Hotel, Piccadilly, the drawings of the steelwork have been made with a view to reduce work and trouble in the shop and to dispense with template making, resulting in more accurate work and a better fit on the site than if the spacing of rivets were determined by the template maker in the shop. All standard pieces have a letter the same throughout the job, and this enables the mill to make thousands of pieces often in advance, consequently at reduced cost. The total number of drawings made has been 2,037; while the total amount of blue printing paper used is approximately 13,000 lin. ft., 30ins. wide. The number of drawings required shows that the system here adopted is expensive in the engineer's office, but it is evident that the clients can expect better work and money to be saved in the shop, and that the difficulties on the site will be reduced to a minimum. The whole structure is composed of the following approximate number of pieces:—5,200 beams, 550 columns and struts, 55 plate girders, 3 trusses, 4,000 cast-iron separators and 44,000 field rivets. (Page 148.)

A British embassy in a foreign capital is the subject set for the Royal Academy gold medal and travelling studentship in architecture. (Page 158.)

A new police-court and station has been built near the Tower Bridge from designs by Mr. Dixon Butler. (Page 158.)

The Rhodes Memorial is to be erected on the Groot Schuur estate. Watts's "Physical Energy" will form the central feature, with an architectural colonnade as background. (Page 158.)

The Birmingham Architectural Association has passed a resolution approving the principle of architects' registration. (Page 157.)

Mr. Alfred East asks for the consideration of landscape in the decorative painting of buildings. He claims that it can convey a sentiment as pure, as high and as noble as a composition of figures can do. (Page 156.)

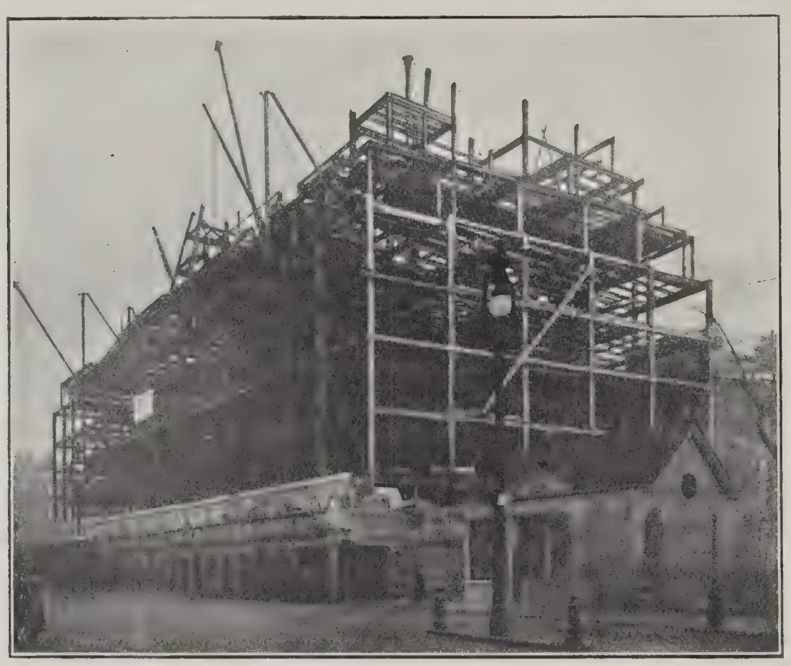
Royal Academy Exhibition, 1905.

The sending-in day for architectural works at the Royal Academy is Friday next, March 24th. We shall be glad to deliver drawings free of charge, but cannot undertake to receive them after 3 p.m. on the sending-in day.

Lady Tracers. At a recent dinner of the "Anciens élèves de l'Ecole" in Paris, M. Moyaux, who presided, took occasion to remind his hearers that two years ago, when he filled the same post, he had spoken somewhat jeeringly of the new proposal to admit young women to the architectural courses of the Ecoles des Beaux-Arts. He now confessed he had seen some young women who "handled the T-square and triangle as deftly as needle or crochet-hook and knew how to mix a batch of concrete with as full an understanding as if it were a matter of the domestic *pot-au-feu*," and he added that although the affluence of diploma-winning women was not at present very redoubtable, it might become so, since *la femme architecte aura pres du client des moyens persuasion autrement séduisants que ceux dont le sex fort peut disposer*—which truth holds good the world over, no doubt. The lady architect, however, is not without her disadvantages, and there is no likelihood of the profession being seriously invaded just yet. We suggest, meanwhile, that, following the lead of the Government drawing-offices, women might find ready employment as tracers for architects. Mr. James A. Smith, M.I.N.A., points out that it is common for them to be so employed in engineers' offices in the North; in fact, in some of the large Clyde shipbuilding yards women are employed not only to do the whole of the tracing of proposal, contract and working plans, but also to work out many of the intricate calculations of displacements, positions of metacentres, &c. Long experience has shown that the tracing can be neatly and reliably done by them, and the mechanical working out of calculation sheets is satisfactorily performed, the latter having, of course, all the multipliers, &c., printed in, and the ordinates, intervals, &c., filled in beforehand by the draughtsman in charge of the work. The immediate result of this is to free the draughtsman, and particularly the apprentice, from a vast amount of mechanical and uninteresting work. In architects' offices we have no doubt the same system could often be adopted with advantage.

Ownership of Drawings. The case of *Gibbon* v. *Pease*, and the recent discussion as regards the ownership of architectural drawings which arose out of it, has awakened interest in America. Our contemporary "The American Architect" remarks that as *Ebdy* v. *McGowan*, upon the lines of which the case was judged, is cited in American cases of the kind, it would be quite worth while for the American Institute of Architects to enquire whether the Royal Institute of British Architects, the Surveyors' Institution and the Society of Architects would not allow it, also, to contribute some of the sinews of war necessary to get a reversal of the decision. "But," our contemporary adds, "as the fight may be a long one, and as litigation is costly for defendant and plaintiff alike, it seems just possible that the defendant may offer, and the court force the acceptance of, some compromise before the case reaches the highest court. In such case, perhaps, for the sake of obtaining definite adjudication, it might be well for American money to be used in replenishing the defendant's account." If nothing comes of this appeal, English architects will at least feel happier in the conviction that they have the moral support of their American brethren. The average client takes far too much advantage of the architect and fails to understand that his experience, education and ability must be paid for directly, as he has not the means of securing it by the sale of goods. The Institute scale of fees is inadequate in many respects and needs to be revised, but, at any rate, this further injustice promises to be remedied.

"Specification, No. 8." The general character of "Specification" having been so carefully thought-out from the commencement, and its numerous sections so thoroughly compiled, it necessarily follows that each new issue cannot be materially different in appearance to those which have preceded it. On examination, however, the present issue will be found to embrace a number of new and important articles and a fresh collection of working drawings, while the several divisions into which the work is divided have all been carefully revised, brought up to date, and amplified where considered desirable. Among the new articles included in the volume is one on the planning of mine buildings—appealing particularly to Colonial readers; another on estate management; a very able article on reinforced concrete by Mr. Arthur T. Walmisley; another by Prof. Robert H. Smith on "Methods in Practical Calculation"; while the concluding part is given of Mr. Sloan's article on "The Construction of Arches, Vaults, &c." Mr. Walmisley, too, has rewritten the "Structural Engineer" section, dealing with the design of girders, roofs, arches, &c., in a way which enables architects to calculate for themselves, without relying on manufacturers' catalogues. The "Gasfitter" and "Painter and Decorator" sections have been revised by well-known authorities, and the "Electrician" section has been rewritten. In all there are more than seven hundred pages in the volume. As a technical authority for everyone connected with building it stands pre-eminent, and is wonderful value for half-a-crown.



RITZ HOTEL, PICCADILLY. *(Photograph taken on March 8th.)*

THE RITZ HOTEL.

We publish below some notes on the design of the steelwork for the Ritz Hotel, Piccadilly, London, W., contributed by Mr. Bylander, the engineer, who is responsible for this portion of the work. Mr. Bylander has had considerable experience in the design of steel-framed or skeleton buildings in the United States; and in view of the novelty of this method of building in this country, and the importance of English architects and contractors becoming conversant with the principles, the article should be studied carefully. We would particularly call attention to the great exactitude of the work, every dimension being figured on the drawings and nothing left to be scaled off; the elaborate nature and number of the drawings—this being no useless expense, because the drawing-office expenses form but a small percentage of the cost of the steel, and the German steelworks are thereby enabled to execute the work at a reduced price and without preparing templates, as is usual in English practice; and finally the careful way in which the details are standardized and facility of erection studied both to secure cheapness and to aid the execution being correct as designed.

NOTES ON THE STEELWORK.

By S. Bylander.

The Ritz Hotel is a steel-framed building, or so-called "cage construction," all loads, inclusive of exterior walls, being carried on beams and girders to columns and grillages.

Owing to heavy exterior back walls and limited site for foundations, relatively complicated foundations with cantilever girders had to be introduced. The construction practically conforms to the latest standards for steel-framed office buildings in America.

The hotel has its frontage to Piccadilly, and occupies the site between Green Park and Arlington Street. The length to Piccadilly is 231ft. 4½ins., to Arlington Street 115ft. 2¼ins., and to Green Park 87ft. 1⅛ins. The angle between building lines to Piccadilly and Arlington Street is 83° 3′ and to Piccadilly and Green Park 96° 36′ (as shown on the site plan published in our issue for November 2nd last, p. 238).

The area of the site is about 23,200 sq. ft. and the area of ground floor 22,000 sq. ft. The average area of each of the upper floors is about 19,000 sq. ft. The finished floor level of the ground floor of the hotel, which is called "hotel datum," is 1ft. 6ins. above the pavement level at the centre of the main entrance, and at building line to Piccadilly. The hotel datum or ground-floor level is 65·63ft. above British Ordnance datum. The basement floor is 22ft. 7½ins. below the ground-floor level. Part of the building has a mezzanine floor between basement and ground floors, and is called "lower ground floor." Above the ground floor there are seven floors.

On the Piccadilly and Green Park fronts the roof slopes at an angle of 75 degs., and extends from sixth floor to flat-roof level, which is 98ft. above "hotel datum." Owing to ancient light requirements the roof at Arlington Street was made sloping from fourth floor at an angle of 45 degs.

The front to Piccadilly has three pavilions, the highest point of them being 114ft. 6ins. above "hotel datum."

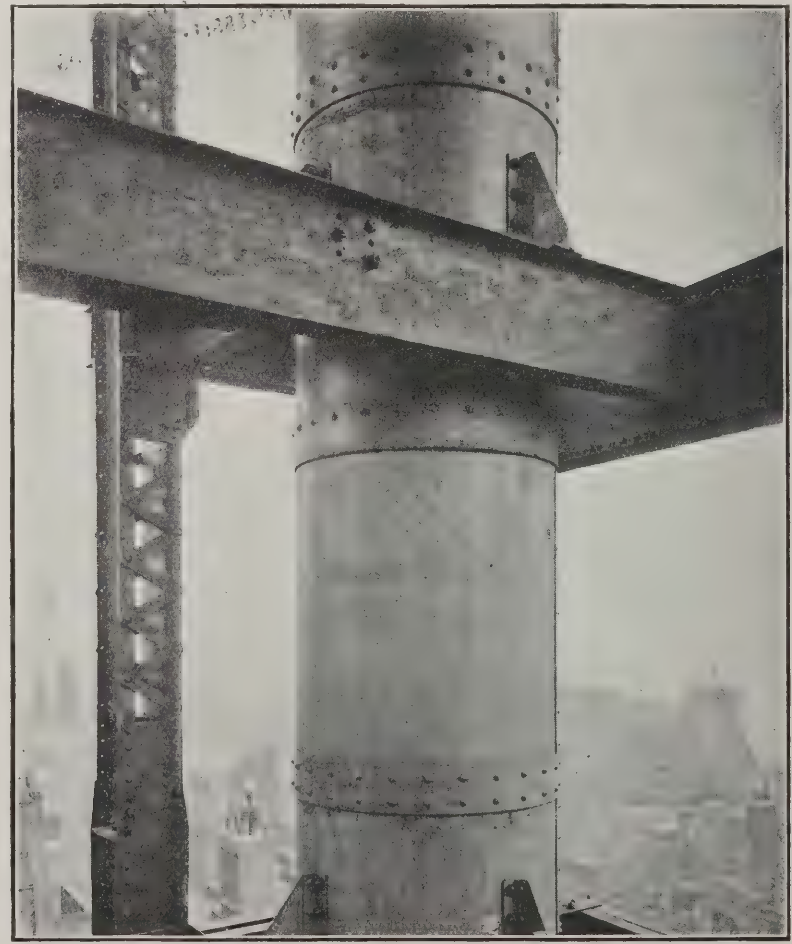
The cubical contents of the building is about 2,413,000 cub. ft. covered space.

The front walls facing Piccadilly, Arlington Street and Green Park will be of brick with stone or granite facing, the granite extending from the ground floor to the first-floor level.

The thicknesses of walls are according to the requirements of the London Building Act, being 39ins. thick at the street level and 14ins. at sixth-floor level.

In view of erecting the steelwork independently of brickwork or masonry, care has been taken in the design for bracing during erection. No columns or members subjected to great lateral strain have been made of cast-iron, and all steelwork is riveted. Great care has also been taken to protect the steelwork from corrosion or other deterioration, and to ensure the preservation and durability of all parts of the structure, by painting and covering with concrete, brick or terra-cotta.

As will be noticed on the column plan on pp. 290 and 291 of our issue for November 30th last, the columns have been placed in straight lines, and square with the building line to Piccadilly wherever possible and as far as the architectural requirements have allowed. Particular care has been taken to place them so as to allow for easy erection. The steel columns which carry floors and walls are supported at the basement level on cast-iron bases averaging 3ft. square and resting on steel grillages and concrete beds or footings. The concrete footings are 18ins. thick, and placed in pockets excavated in the clay about 5ft. 6ins. deep below basement



RITZ HOTEL: DETAIL OF STEEL CHIMNEY STACK AT FOURTH FLOOR.

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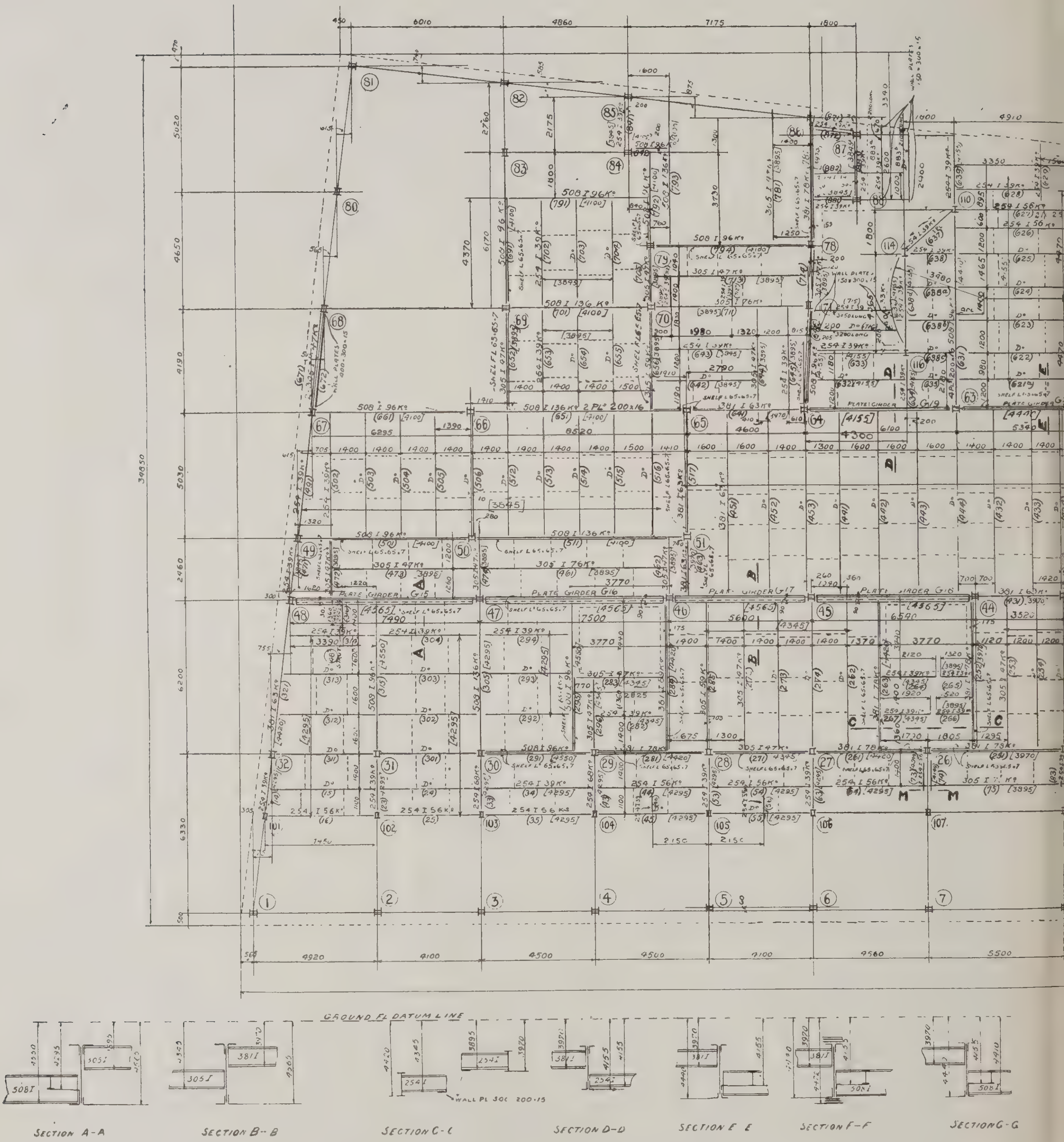
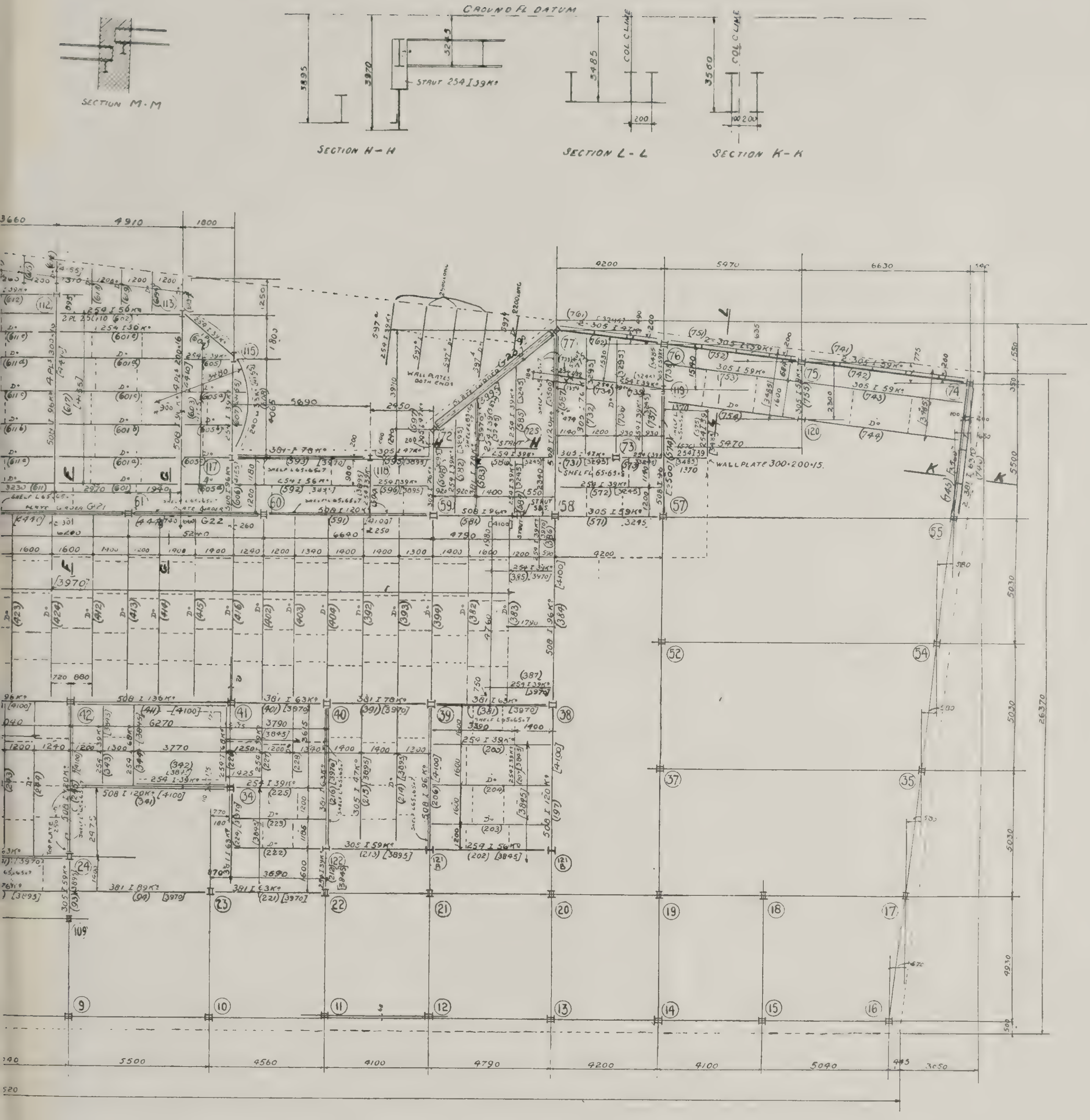
Supplement to
The Builders' Journal and Architectural Record,
Wednesday, March 22nd, 1905.





FIGURES IN BRACKETS THUS [ ] GIVE THE DISTANCES
ROM GROUND FLOOR DATUM LEVEL TO BOTTOM FLANGE OF BEAMS

WARING WHITE
BUILDING C°
CONTRACTORS

MEWES & DAVIS
ARCHITECTS

M.A. POTTS & C°
ENGINEERS

RITZ ~ HOTEL
PICCADILLY
LONDON, W.
LOWER GROUND FL. FRAMING PLAN

DIMENSIONS IN MILLIMETRES

DATE MADE 10.3.04
ORDER No 107
DRAWN BY G
CHECKED BY B
TRACED BY HRG
IN CHARGE OF J P. Glendol

DRAWING N° 4

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level, as indicated on the grillage plan published on pp. 236 and 237 of our issue for November 2nd last. The average size of grillages is 12ft. One of the large grillages is illustrated by Fig. 1 on this page.

In figuring the sizes of footings the dead load only has been considered, in order to secure uniform settlement, if any, and the following assumptions were made for figuring these:—

Weight of brickwork laid in cement-mortar - 120 lbs. per cub. ft.
Weight of granite - - 170 ,, ,,
,, stone - - 150 ,, ,,
,, floors, inclusive of steel - 100 ,, ,,
,, steel columns was calculated from the column schedule.

As the total dead load of floor only amounts to 80 lbs. to 90 lbs. per sq. ft., about 10 per cent.

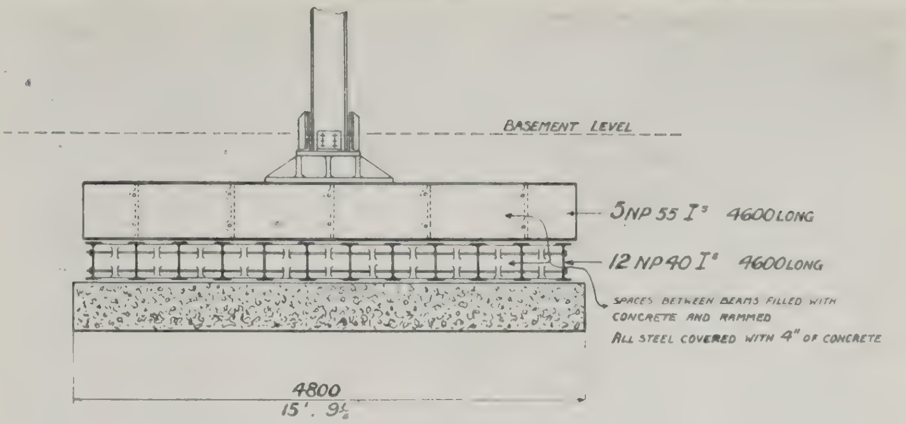
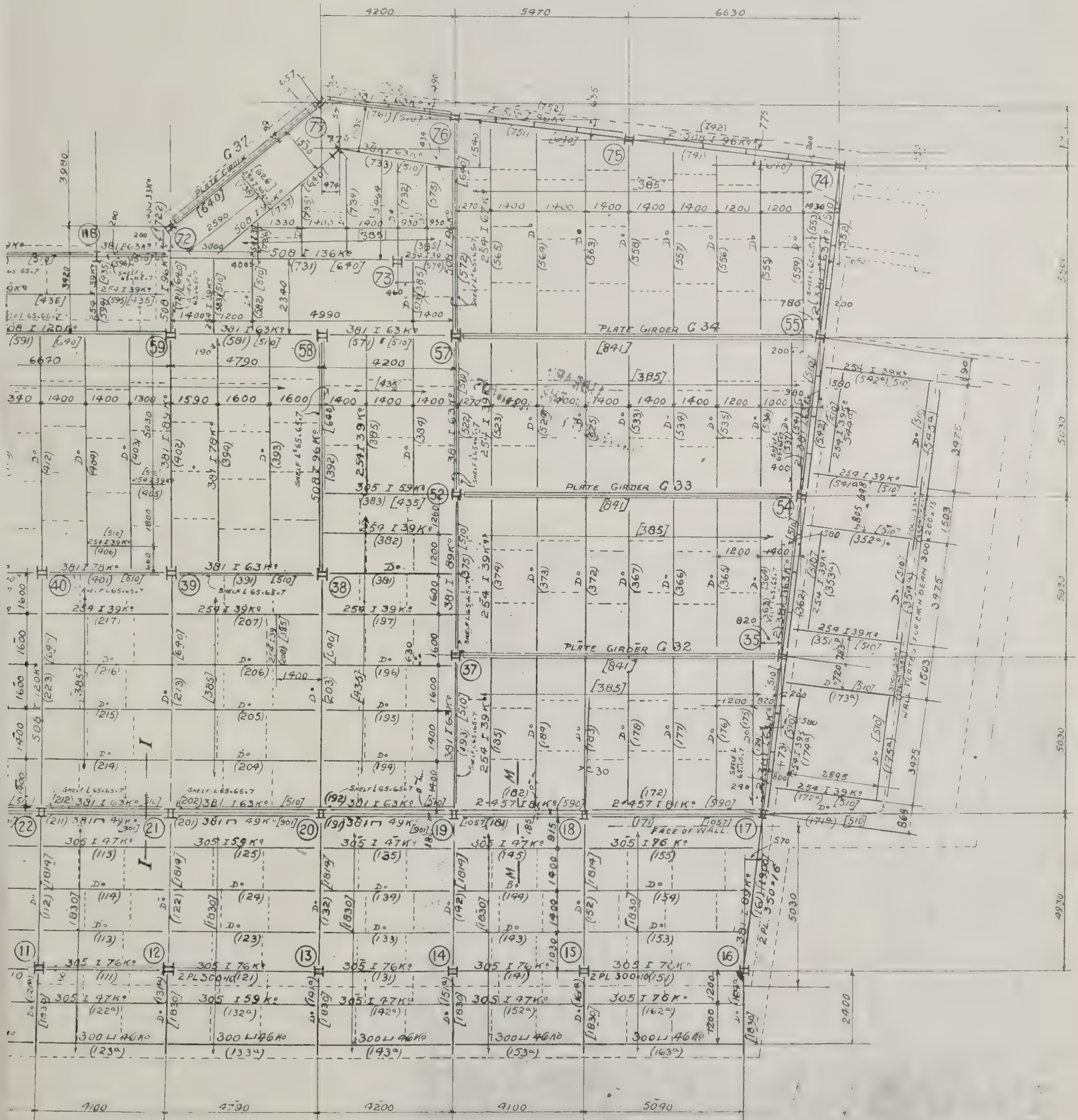

BASEMENT LEVEL
5NP 55 I^s 4600 LONG
12 NP 40 I^s 4600 LONG
SPACES BETWEEN BEAMS FILLED WITH CONCRETE AND RAMMED
ALL STEEL COVERED WITH 4" OF CONCRETE
4800
15'. 9¼

FIG. 1.—GRILLAGE FOR COLUMN NO. 61.



RITZ HOTEL, PICCADILLY, LONDON: PORTION OF GROUND-FLOOR FRAMING PLAN.

B

RITZ HOTEL PICCADILLY: HOIST FOR MATERIALS ARRANGED IN WELL OF PASSENGER LIFT.

of the live load was included in figuring the floor load on the footings. This will allow for weight of terra-cotta partitions, pipes and ducts. The sizes of the footings have been calculated to the conservative figure of 5,000 lbs. per sq. ft.

The columns are figured for the full dead load and 80 per cent. of the live load. Girders and beams are figured for the full dead and live loads.

In calculating the stresses in the steel a factor of safety of 4 has been used.

The connections between beams and girders and between girders and columns have been made, as far as practicable, in proportion to the loads they have to carry.

With very few exceptions the connections are all riveted. The rivets are determined to carry the loads, and no beam is milled at the ends to fit the lower flange of the beam on which it is resting, as usual in English practice, but strong connections are used to keep the beams laterally supported and to transfer the loads centrally to the beams. The fibre stresses allowed are:—

16,000 lbs. per sq. in. for rolled beams and girders.
15,000 ,, ,, ,, ,, riveted works.
20,000 ,, ,, ,, ,, bearing for rivets.
10,000 ,, ,, ,, ,, shear ,, ,,

All beams in the grillages are braced and kept at the right distance apart by $\frac{3}{4}$in. thick cast-iron separators, and tied together with $\frac{3}{4}$in. diameter bolts. After the first tier of beams was set, concrete was filled between them, after which the second tier of beams was set on top of the lower tier and filled in with concrete in the same manner as the lower tier. The cast-iron bases were carefully levelled on top of the grillages with narrow shims or iron wedges and enclosed by clay dams. The space between the base and the grillage beams, about $\frac{3}{4}$in., was then filled in with cement-grout through holes in the cast-iron bases. The columns were set on their bases 6ins. below the finished floor level, and the concreting was then completed. The bases are, in general, 3ft. square on plan at the bottom. The top and bottom plates are generally $1\frac{3}{4}$ins. thick, reinforced with vertical transverse and diagonal ribs $1\frac{1}{2}$ins. thick.

The wall columns adjoining Lord Wimborne's house had to be supported on cantilever girders in order to keep the grillages inside the building line. The cantilever girders are nine in number, with triple web plates, the average depth being 3ft. and the width of flange plates 2ft. 6ins. The heaviest cantilever weighs 11 tons.

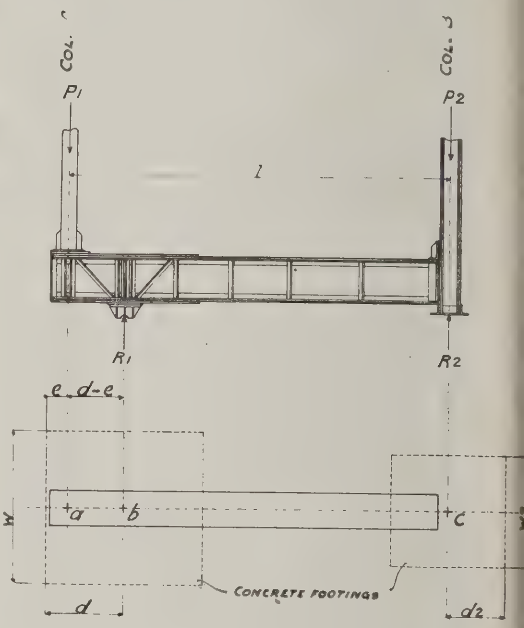
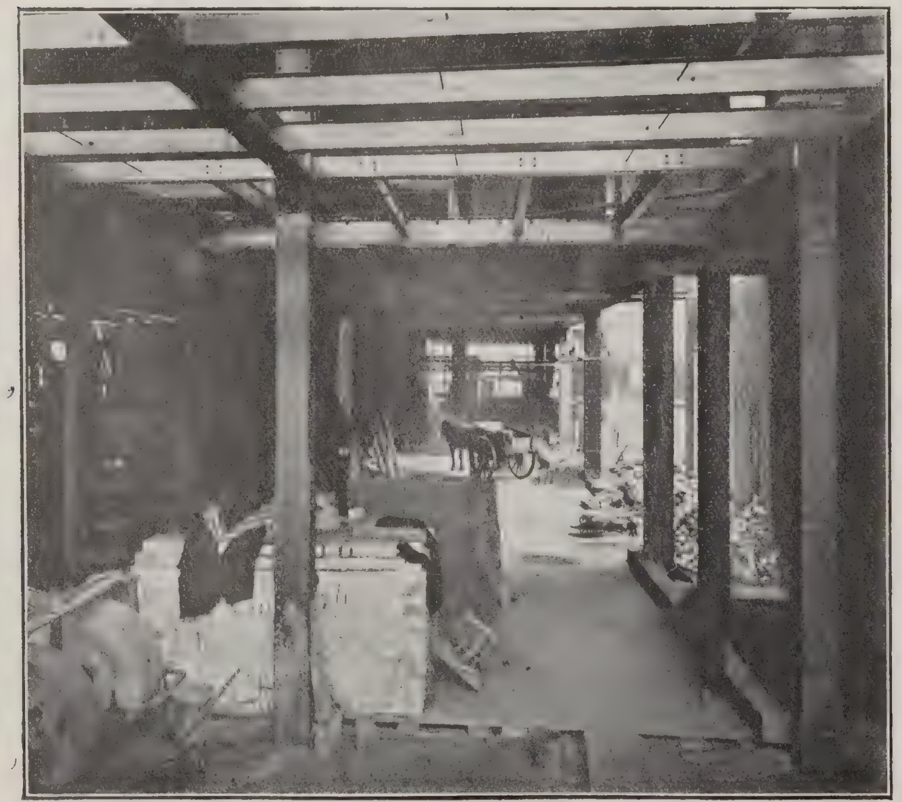


FIG. 2.—CANTILEVER FOUNDATION GIRDER.



RITZ HOTEL, PICCADILLY: INTERIOR VIEW ON GROUND FLOOR. *(March 8th.)*

The following is an example of calculations for cantilever girders:—

Loads are given in tons and lengths in inches.

a = centre of column A.
b = ,, steel base and grillage.
c = ,, column B.
P_1 = load from column A in tons.
P_2 = ,, ,, ,, B in tons.
R_1 = load on grillage at B in tons.
R_2 = ,, ,, ,, C in tons.
w = assumed maximum practicable width of grillage at B.
d = half the length of grillage at B, or distance from building line to centre of grillage.
w_2 = width of grillage at C.
d_2 = half the length of grillage at C.

When "w" is assumed the value of d can be obtained from the following calculation:—

(1) . . . $R_1 = \frac{2dwp}{144}$ = load on grillage at a. As the algebraic sums of the moments around c, taken as moment point, it is found—

(2) . . . $R_1 \times (l-(d-e)) - P_1 l = 0$;

$$R_1 = \frac{P_1 l}{l + e - d};$$

and substituting R_1 in formula (1)

$$\frac{P_1 l}{l + e - d} = \frac{2dwp}{144},$$

$$144P_1 l = 2dwp(l + e - d);$$

$$dl + dc - d^2 = \frac{144P_1 l}{2wp};$$

$$d^2 - d(e + l) - \frac{144P_1 l}{2wp} = 0.$$

The value of d is—

$$(3) \quad . \quad . \quad d = \frac{e + l}{2} \pm \sqrt{\left(\frac{e+l}{2}\right)^2 - \frac{144P_1 l}{2wp}}.$$

By examining this formula it will be seen that d has two positive values, and it looks as if both values were possible; but as no consideration has been paid to the size of grillage at c, nor the value of P_2, it will be easily found that only the smaller value of d obtained by using minus is practicable.

As the value under the root sign must be positive, it will be found that the minimum value of w according to equation (3) is

$$w \geqq \frac{144P_1 l}{2p\left(\frac{e + l}{2}\right)^2}.$$

For this value of w, d will be equal to $\frac{e + l}{2}$, and this is possible only when the two columns have a common grillage and $P_1 = P_2$.

The maximum practical value of d in the case of cantilever construction, as can be seen from Fig. 2, is $d \leqq \frac{e + l}{2} - d_2$.

Having found d, the value of R_1 is obtained from (1).

As the algebraical sum of forces acting upon the girder (in this case they are all vertical) must be zero, we can write:—

$$P_1 + P_2 - R_1 - R_2 = 0.$$

$$R_2 = R_1 - P_1 - P_2.$$

The area of grillage under B is

$$= \frac{P_2 - R_2}{p} = 2d_2 \times w_2,$$

should $P_2 - R_2$ be negative, which it would be if $P_2 = 0$, or no column B were in existence. Such a case can be seen on grillage plan of the Ritz Hotel on pp. 236 and 237 of our issue for November 2nd last, the tail end of the cantilever girder supporting column 75 having to be fixed to and anchored down by means of a cross girder.

The area of grillage at a is $= 2dw$.

The maximum bending moment on the cantilever girder is—

$$M_{b\,max.} = P_1 \times (d - e) \text{ tons-inches},$$

$$\text{Sheer}_{max.} = P_1 \text{ tons},$$

and the section of girder can now be determinated from above.

The wall-plates on the cantilever girders are reinforced with plates and angles to take up the shear and transmit the load from column to cast-steel supports on the grillage. The flanges consist of 4 angles 6ins. by 6ins. by $\frac{5}{8}$in., and are reinforced with cover-plates of different lengths. The rivets used are $\frac{7}{8}$in. in diameter and placed ziz-zag; two rows in each leg of the angles. On top of the cover-plates the cantilever girder has a plate $\frac{3}{4}$in. thick, with countersunk rivets, and afterwards planed so as to give good bearing for the column, which is field-riveted to the girder. The tail end of the cantilever girder is field-riveted to the flange of the column to a plate riveted on the column sufficiently large and strong to transfer, by means of $\frac{3}{4}$in. rivets and stiffener angles, the force necessary to keep the cantilever girder in position.

The columns are of the closed cross-section type, consisting of two 12in. channels and 14ins. wide cover-plates, except on the upper floors, where, the loads being less, two 12in. channels, latticed, have been used.

The columns have been figured for concentrated and eccentric loads. Columns with very small eccentric loads have been considered as concentric loaded, and a fibre-stress of 12,000 lbs. per sq. in. has been used, when $l : r$ is less than 90. For eccentric loaded columns a maximum combined stress of bending and compression of 14,000 lbs per sq. in. has been allowed.

The outside dimensions of columns have been kept practically constant, and the cross-section has been changed by using materials

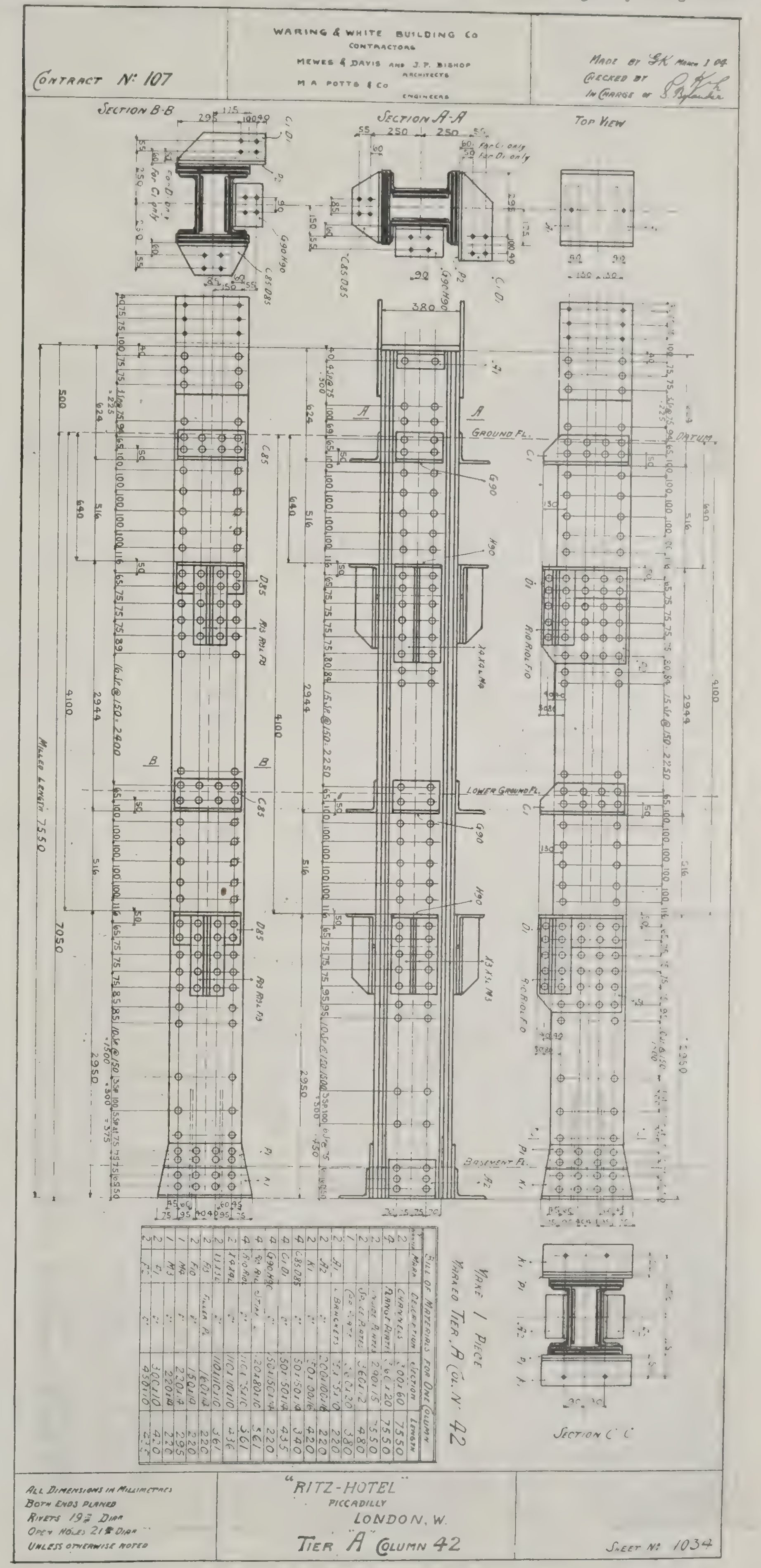


FIG 3.

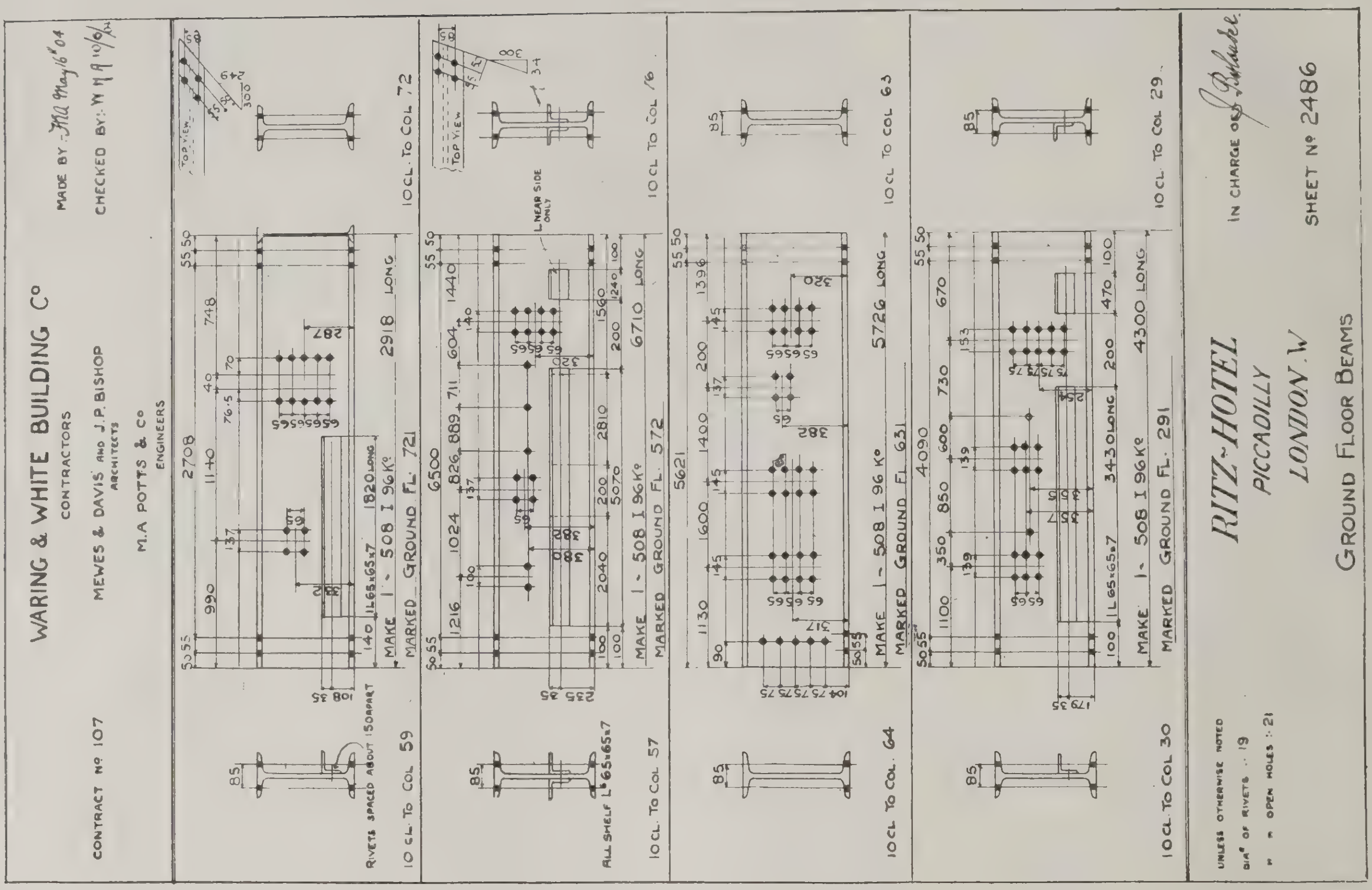

WARING & WHITE BUILDING Co
CONTRACTORS
MEWES & DAVIS AND J.P. BISHOP
ARCHITECTS
M.A POTTS & Co
ENGINEERS
CONTRACT No 107
MADE BY
CHECKED BY
MAKE 1 - 508 I 96 Ko
MARKED GROUND FL 721
2918 LONG
10 CL TO COL 59
10 CL TO COL 72
MAKE 1 - 508 I 96 Ko
MARKED GROUND FL 572
6710 LONG
10 CL TO COL 57
10 CL TO COL 16
MAKE 1 - 508 I 96 Ko
MARKED GROUND FL 631
5726 LONG
10 CL TO COL 64
10 CL TO COL 63
MAKE 1 - 508 I 96 Ko
MARKED GROUND FL 291
4300 LONG
10 CL TO COL 30
10 CL TO COL 29
RIVETS SPACED ABOUT 150 APART
ALL SHELF L's 65 x 65 x 7
TOP VIEW
L NEAR SIDE ONLY
UNLESS OTHERWISE NOTED
DIAr OF RIVETS 19
" " OPEN HOLES 21
IN CHARGE OF
RITZ-HOTEL
PICCADILLY
LONDON W
SHEET No 2486
GROUND FLOOR BEAMS

FIG. 5.

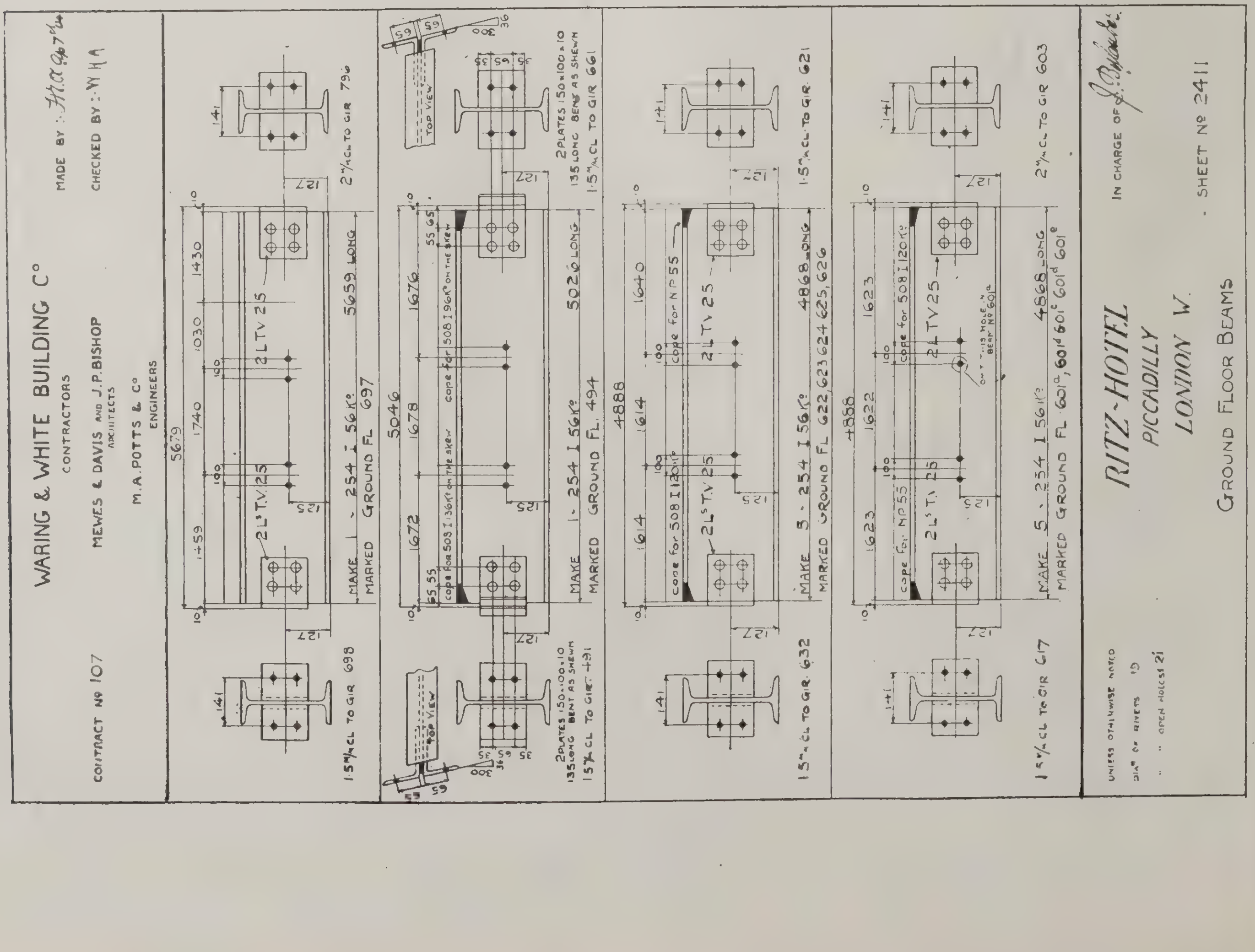

WARING & WHITE BUILDING Co
CONTRACTORS
MEWES & DAVIS AND J.P. BISHOP
ARCHITECTS
M.A. POTTS & Co
ENGINEERS
CONTRACT No 107
MADE BY
CHECKED BY: W H A
2Ls T.V. 25
MAKE 1 - 254 I 56 Ko
MARKED GROUND FL 697
5659 LONG
1.5 CL TO GIR 698
2 CL TO GIR 796
MAKE 1 - 254 I 56 Ko
MARKED GROUND FL 494
5026 LONG
2 PLATES 150 x 100 x 10
135 LONG BENT AS SHEWN
1.5 CL TO GIR 491
1.5 CL TO GIR 661
COPE FOR 508 I 136 Ko ON THE SKEW
TOP VIEW
MAKE 3 - 254 I 56 Ko
MARKED GROUND FL 622, 623, 624, 625, 626
4868 LONG
COPE FOR No 55
COPE FOR 508 I 120 Ko
1.5 CL TO GIR 632
1.5 CL TO GIR 621
MAKE 5 - 254 I 56 Ko
MARKED GROUND FL 601a, 601b, 601c, 601d, 601e
4868 LONG
1.5 CL TO GIR 617
2 CL TO GIR 603
UNLESS OTHERWISE NOTED
DIAr OF RIVETS 19
" " OPEN HOLES 21
IN CHARGE OF
RITZ-HOTEL
PICCADILLY
LONDON W.
SHEET No 2411
GROUND FLOOR BEAMS

FIG. 5.

(channels and plates) of different thicknesses. By this method fifteen different sections were adopted.

Maximum sectional area = 92·5 sq. ins.
Minimum do. do. = 13·3 „ „

Where very heavy loads had to be carried the section was strengthened by adding reinforcing plates riveted to back of channels (see column schedule published in our issue for November 30th last). The heaviest columns in the building are those which carry the heavy plate girders at the second-floor level. The numbers of these columns are 59, 61, 63 and 65 (see column plan, November 30th). These plate girders are supporting the columns 60, 62, 64, which start at the same level. The columns 59, 61, 63 and 65 are built up of three channels 12ins. by 40 lbs. per ft., four cover-plates 19¾ins. by ⅞in., and six reinforcing plates 9ins. by ¾in. (or for the lighter section three reinforcing plates 9ins. by ⅜in.). The sectional area of the heaviest column section is 142 sq. ins. Above the second floor the sections are reduced to the 2-channel type. All columns are made in two-storey lengths and spliced at a distance of about 1ft. 6ins. above the floor-level, their sections being changed at each splice to correspond with the loads they are intended to carry. Both ends of the columns are milled, and in the splice is placed a cap-plate or horizontal diaphragm of exact dimensions, bolted to the columns with angles. This cap-plate gives a good bearing for the column above. The upper section is secured to the lower one by field-riveted vertical splice-plates.

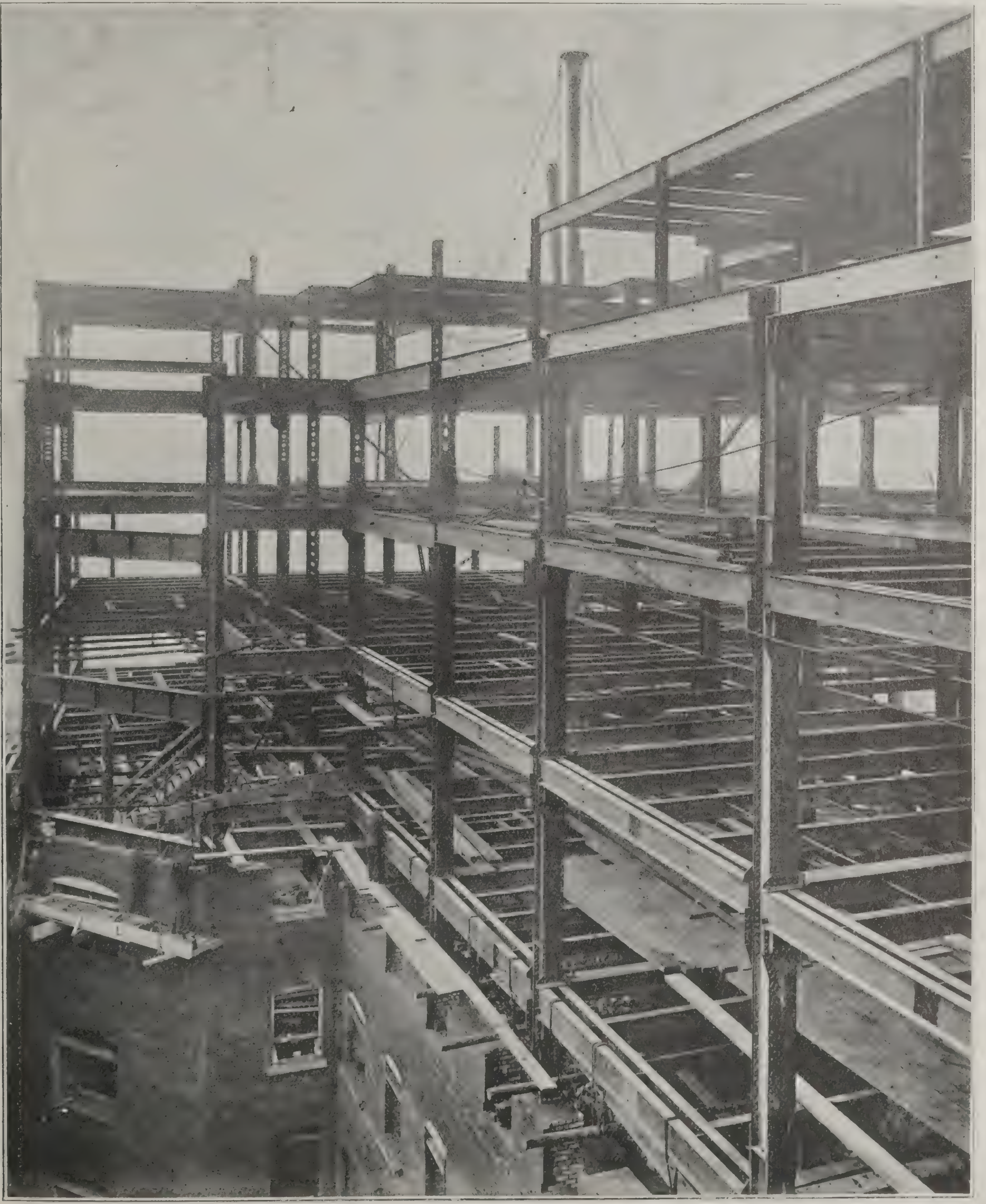
The beams are connected to columns with top and bottom angles shop-riveted to the column, the seat angles being supported by stiffener angles.

A principal shop-detail drawing of a column is shown by Fig. 3 on p. 151 of this issue, from which it will be seen that all dimensions are given and all views shown. The different pieces are marked with reference letters to the bill of materials, which gives sections and lengths of the different parts of which the column is composed. The drawing is made with a view to reduce work and trouble in the shop and dispense with template making. The result will be more accurate work and a better fit on the site than if the spacing of rivets were determined by the template maker in the shop.

All standard pieces have a letter the same throughout the job and this enables the mill to make thousands of pieces often in advance, consequently at reduced cost.

Beams have been placed 1,600, 1,400 and 1,200 millimetres apart, wherever practicable (1,600 millimetres = about 5ft. 6ins.).

The arrangement of dimensioning and marking can be seen on the framing plans reproduced in this issue. The numbering of beams has been made in such a manner that



RITZ HOTEL, PICCADILLY, LONDON: VIEW OF STEELWORK FROM FOURTH FLOOR, LOOKING TOWARDS GREEN PARK.

B¯4

it will be easy for the erectors to find the beams, namely, the number of a beam divided by 10 with the decimal neglected is the number of the column in the same panel, as, for example, the beam numbered 43 is in the same panel as column 4. Beams in different floors have always the same numbers as the beams below.

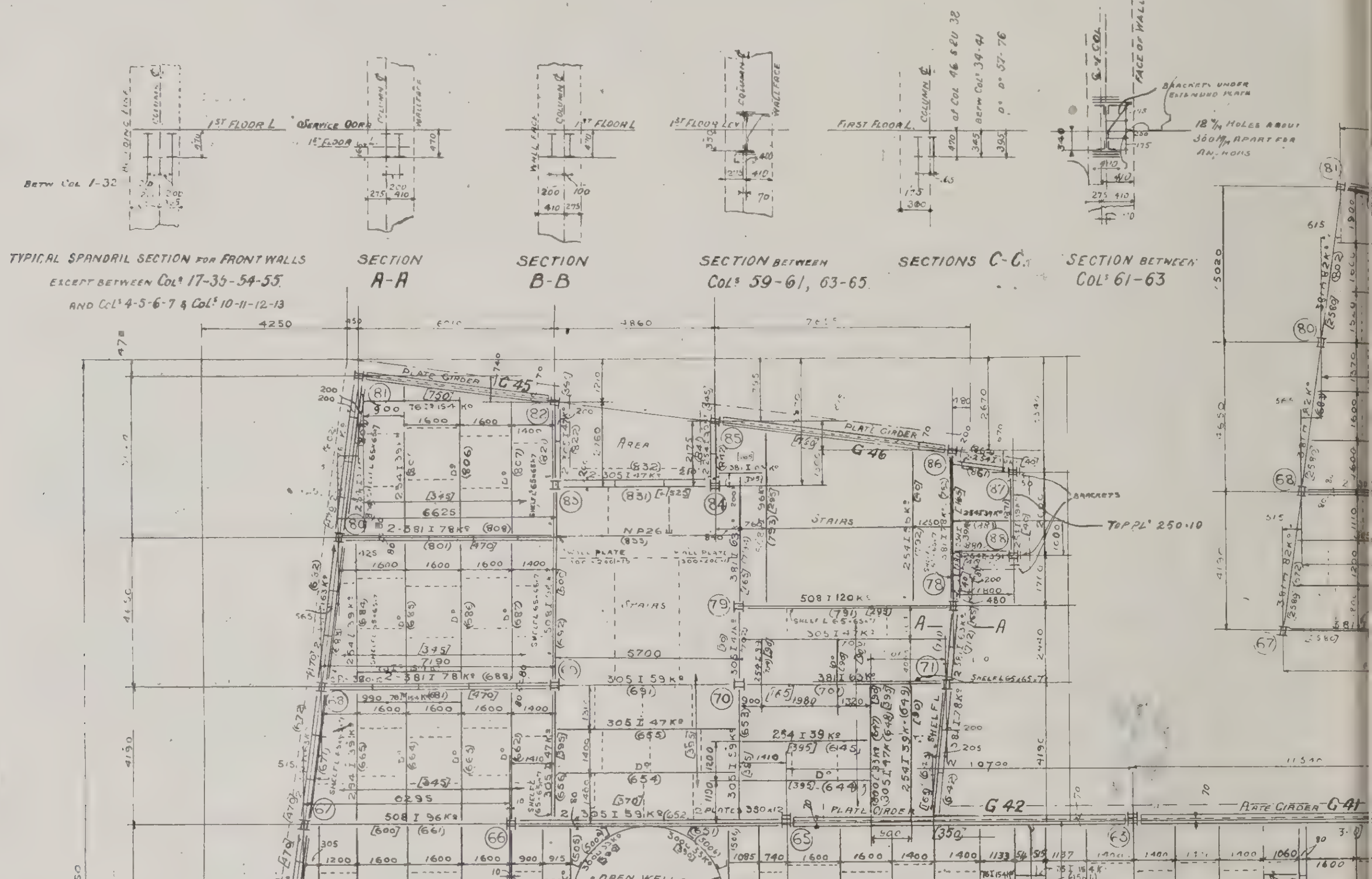
Standard connections and brackets have been used wherever possible, and the load is figured to be be carried by rivets only in the connection.

Coped beams do not rest with their webs on the girder flange, the cope always being made to clear the girder flange with $\frac{1}{4}$in. It has been specified that the variation in length for the rolled and cut beams shall not exceed $\frac{3}{8}$in. Dimensions over angles and distances between holes have been made accurate within $\frac{1}{16}$in. Principal shop drawings for beams are shown on p. 152 of this issue.

It may be of interest to mention here a few particulars in regard to the number of drawings made for the steelwork and also some figures showing the number of steel pieces, such as columns, beams and separators, as below.

Number of drawings, size 40ins. by 27ins.:—

Framing plans	20
Schedules	8
Constructional details	44
Staircases, flues and miscellaneous	150
	222



TYPICAL SPANDRIL SECTION FOR FRONT WALLS
EXCEPT BETWEEN COLS 17-35-54-55 AND COLS 4-5-6-7 & COLS 10-11-12-13
SECTION A-A
SECTION B-B
SECTION BETWEEN COLS 59-61, 63-65
SECTIONS C-C
SECTION BETWEEN COLS 61-63
PLATE GIRDER G 45
PLATE GIRDER G 46
G 42
PLATE GIRDER G 41
AREA
STAIRS
OPEN WELL 4560 DIAR
AREA C
BRACKETS
TOP PL 250×10
35265

For First Floor.—Note: Figures in brackets thus [ ] give the distance from finished floor level to bottom flange of beams. All bea

Number of sheets, size 28ins. by 14ins.: —

Column details	441	
Plate girder details	35	
Miscellaneous	40	
		516

Number of sheets, size 14ins. by 9ins.: —

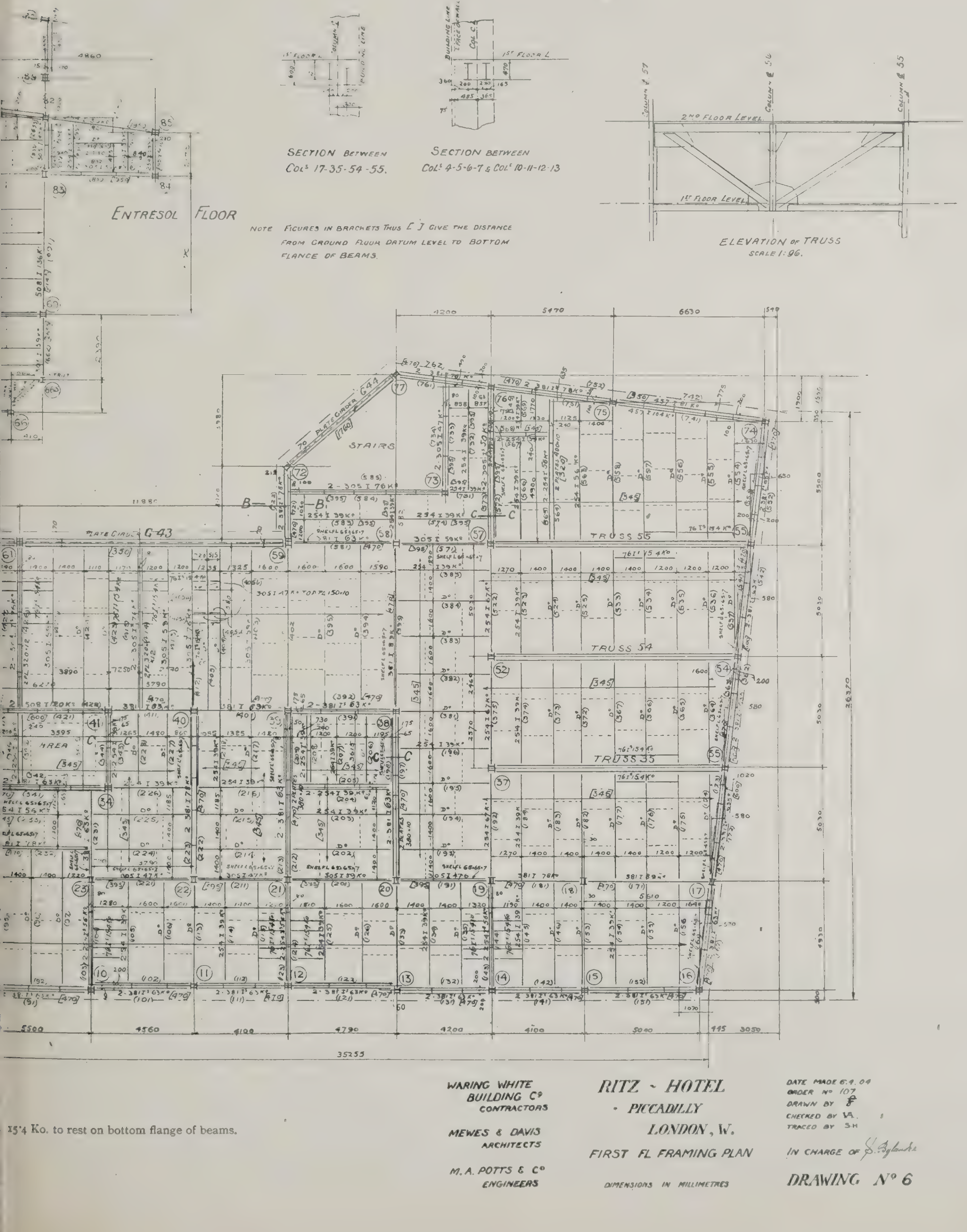
Beam detail sheets	983	
Mill order lists	266	
Miscellaneous	50	
		1,299
Total number of drawings		2,037

The total amount of blue printing paper used has been approximately 13,000 lin. ft., 30ins. wide.

The number of drawings required shows that the system here adopted is expensive in the engineer's office, but it is evident that the clients can expect better work and money to be saved in the shop, and that the difficulties on the site will be reduced to a minimum; thus on the whole saving them considerably more money than the extra cost involved in the drawings by the adoption of this thorough system.

The whole structure is composed of the following approximate number of pieces as named below:—

Beams	5,200
Columns and struts	550
Plate girders	55
Trusses	3
Cast-iron separators	4,000
Field rivets	44,000



15'4 Ko. to rest on bottom flange of beams.

The Present Condition of the Building.

The general photographic view on p. 148 shows the condition of the building on March 8th, on which date all the other photographs published in this issue were also taken. In studying the progress of this job it should be borne in mind that the contractors, the Waring White Building Co., Ltd., were delayed about six weeks during November and December owing to the slowness of the German mills in fabricating the steel and poor deliveries by rail and steamer, in addition to other unforeseen contingencies, such as fog, low tide, &c. Most of the steel is now in position and all of it is on the site. The American derricks are a distinguishing feature of the general views; there are four derricks used for handling stone, three for handling steel (only one of which is of American type) and one 5-ton hand-crane also for the steel. There are, in addition, hoists in four of the five areas, for taking up material, one of which we illustrate on p. 150 of this issue, which at the same time shows the iron barrows used on the job. The granite which goes to the first floor is now practically complete, and the Portland stone for the rest of the front will be rising soon. The Columbian Fireproofing Co. has made great progress with the floors, and the interior brickwork is proceeding apace. The steel chimney stack from the boilers illustrated on p. 148 is secured to the steel frame with a proper arrangement made for expansion; it is lined with 4½ins. of firebrick, with an air-space between that and the metal. Among other obvious points of interest in the photographic view on p. 153 we may call attention to the kind of painters' light scaffolding suspended from the steelwork for the use of the bricklayers, who are shown at work. The architects of the hotel are Messrs. Mewes & Davis & John P. Bishop, A.R.I.B.A., of 25, Dover Street, London, W.

R.I.B.A.

Decorative Painting.

A MEETING of the Royal Institute of British Architects was held on Monday evening at 9, Conduit Street, W., the chair being occupied by the president, Mr. John Belcher, A.R.A.

The decease of Mr. Charles Bennett Arding, Associate, and Prof. Ludwig Peter Fenger, Hon. Corresponding Member, of Copenhagen, was announced.

Papers on "Decorative Painting" were then read by Sir William Richmond, R.A., Mr. Alfred East, A.R.A., and Mr. Solomon J. Solomon, R.A.

Sir William Richmond's Paper.

Sir William Richmond in his opening remarks referred to the ties which united the arts of architecture, sculpture and painting. The votaries of architecture were builders who designed and erected, sculptors who designed and carved, painters who enlivened its severe spaces with the glory of colour, craftsmen who brought glitter and sunlight into its darkest nooks as rays of light into a cavern. Late in history, architecture had wished to go alone. Hence arose the danger that ornament might be stereotyped and of trade manufacture, painting cease to add its magical charm, and sculpture be relegated to an independent and solitary mission.

Coming to the special branch of the arts he was to discuss—viz., Decoration, which included mosaic and mural decoration—the author said he feared that the delightful method of "buon fresco" was for the present an impossible one to pursue in London owing to the vitiated atmosphere produced by disintegrating acids which were destructive to lime; but in the country, where pure air was obtainable, "buon fresco" might be adopted for interiors with as much security as in Italy in times past. Provided there was no poison in the atmosphere, damp was the only enemy to fresco.

Mosaic is adaptable to exteriors as to interiors, but to be effective mosaic must be used lavishly. But mosaic demands another kind of design and drawing from any other material for decoration. The translation of pictures into cubes is absurd. Mosaic can do what no other method is capable of, but it cannot imitate excepting inadequately. The design must be clear, the drawing severe, the accidents few, the light and shadow rare. An architect should build for mosaic decoration if he intends to use it. He should give plenty of domes, semi-domes, alcoves, because mosaic looks best upon curved surfaces, where it is least likely to come into competition with pictorial design. A building to receive mosaic should have few mouldings or frames; the framing of mosaic pictures should be executed in mosaic, and string-courses as well as mouldings should be so designed as to be in harmony with the style which is essential to mosaic, and that is severe. The architect must consider his decoration while he is initiating the plan for his enterprise as well as the elevation. In a well-built mosaic the construction is never hidden or the joints concealed. The mosaics that look best from a distance have a good wide joint between every cube.

The next best method for wall decoration to "buon fresco" is tempera painting upon a dry wall of lime and marble dust. The tempera used is the yolk of egg only, not the white. When dry this becomes as hard as the hardest varnish. The yellow tint gives a very agreeable tone to the white lime. Almost all colours can be used with egg. Egg painting has stood the test of time; many of the wall-paintings at Pompeii are in egg alone, and all the tempera pictures and wall-paintings in Italy which are not fresco or wax are painted with egg tempera.

Wax painting is another method well suited to our climate. The method, technical details of which were given by the author, may be seen in the National Gallery exemplified by portraits on wood of the second century B.C., and in many of the wall-paintings at Pompeii and Herculaneum. The author said he had tested some Egyptian wall-paintings and found that they were executed in wax and spirit. Wax-painting is perfectly durable on a wall, but not on canvas. In England it would be advisable to burn the wax well into the wall with artificial heat.

Oil-painting should be entirely abjured in decoration.

All decoration should be done upon the wall, where it is subjected to environment, and not be applied. Notwithstanding personal discomfort, painters should execute their works *in situ*—even in a dark corner, because that dark corner is the place of the picture, which if painted in full light of a studio will be quite disappointing when it is placed in an obscure light. The same law of fitness holds good as regards sculpture. A statue designed to be set in a niche should belong to it and to nowhere else—more, it not only belongs to its immediate but to its less immediate surroundings also, and is out of place away from there.

Mr. Alfred East's Paper.

Mr. Alfred East, A.R.A., took for his branch of the subject "Landscape Painting as a Medium of Decoration," and showed that it had been almost ignored as a mediun of decoration. The architect, like the figure-painter, had kept it strictly in the background. The architect may desire a certain colour arrangement to complete the object he has in view; he never thinks that he can find what he wants in landscape. He has the right to demand certain conditions as to scale. To accept those conditions, to work within them so that there is no apparent effort in so doing, is in itself an artistic accomplishment. The architect has no reason to fear that in the adoption of landscape he endangers any of these principles; he may find in such decoration the sentiment of his architecture, the purpose of its being. If he has built a place of worship there is absolutely no reason why the walls or windows should illustrate the lives of the saints. There are things in nature which suggest a lofty purpose in their creation, and which reveal the high purpose of the creator. There are also the materials in nature by which the artist can convey a sentiment as pure, as high and as noble as a composition of figures could do. An architect would not tolerate any loud assertiveness of decoration whose anecdote completely distracted the attention of the spectator from the fine proportion of his building. He contended that his claim for the consideration of landscape painting as a medium of decoration was that it could conform to give high purpose, and that it did conform to give just demands.

Mr. Solomon J. Solomon's Paper.

Mr. Solomon J. Solomon, A.R.A., first dealt with certain objections raised by architects when discussing decoration. With regard to the argument that the finances at the architect's disposal did not admit of the inclusion of the painter's art into his schemes, he suggested that as the edifice would outlive its author he might be permitted to provide for its future. Take a building of a national character: he should be permitted to allot some spaces, to indicate to future generations the lines upon which the work should be carried on; in fact, broadly to indicate the kind and style of decoration he would have others introduce. Another fault found was that our variable climate played tricks with existing canvas decorations, causing them to sag and loosen. The fault lay with the use of too large a surface of canvas, when sometimes the architectural features which should be real are imitated by the painter. Again, few practical men would use a fresco ground for painting when the "matt" surface, its chief quality, can be obtained by the use of suitable mediums, and when far greater richness of effect can be produced by other methods ready to our hands. In France most public buildings are decorated by the painter, and none of the technical troubles complained of here were apparent. The author asked the attention of the Institute particularly to his suggestion for the promotion of a school of decoration, not with the object of competing with existing schools, but of supplementing them. His idea was that it should be a school common to the architect, the sculptor, painter, glass designer, and woodcarver, for the use not only of the advanced student but equally for the full-fledged craftsmen in the various arts who desire a special training in the arts of decoration. Professors there would be representing all the branches concerned to lecture and teach; studios furnished with reduced models, or studios of pictorial decorations in their settings, applied sculpture, glass, woodwork, &c.; all conceivable facts, measurements, scale, proportions, anything and everything for the use of the student that could be collected, carefully tabulated and arranged; the creation of travelling studentships, enabling students to travel in pairs—an architect with a painter, an architect with a sculptor, and so on, with provision to make reduced copies of fine examples of art in their settings—the results going to enrich the school collection, so that by degrees these models might replace the photographs or other less useful authorities.

A discussion followed in which Sir Aston Webb, Prof. Beresford Pite, and Messrs. H. Heathcote Statham, J. D. Crace, E. W. Hudson and John Belcher took part.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

City and Guilds Examinations.

S. T. P. writes: "Where can I obtain past examination questions for the City and Guilds in Honours, Quantities?"

From Mr. John Murray, Albemarle Street, London, W.

Fractured Stone Mullions.

BOLTON.—WARDEN writes: "The stone mullions of a five-light stained-glass window at the east end of a church are fractured at the joints, by reason of the corrosion of the 1½in. by 3in. iron bar which goes across the window. Do you advise new mullions, or do you consider the present ones could be repaired so as to make a satisfactory job? I should like to avoid taking out the stained glass if possible. Sketch sent (not reproduced)."

We think the mullions should be replaced. The stained glass can be removed without damage.

Buildings to Measure near Farnham and Horsham.

X writes: "Is there anything near Farnham (Surrey) or Horsham suitable to measure for the R.I.B.A. final examination?"

Most of the churches in the districts named possess good features to measure. Rickman mentions churches at Horsham and Chiddingfold as being Early English, Petworth as Decorative, and Billingshurst as Perpendicular. Chichester, about 45 minutes' journey from Horsham, would furnish you with ample field for selection. Bromshill House, about 10 miles from Farnham, is an excellent example of Elizabethan work. It was built for Henry, Prince of Wales, by Inigo Jones, and is the best of his earlier works. M.

Lincoln Cathedral.

LINCOLN.—S. P. D. writes: "What portion of Lincoln Cathedral—easily accessible—do you recommend to measure and make a drawing of?"

If only a small fragment is needed, some of the internal wall arcading would suffice, but much more is to be learnt from the rich door to the chapter-house; while there is no great difficulty, by utilizing the triforium, in measuring a bay of the nave arcade. The best thing to do is to go there and select for yourself on the spot. All is so good that it is difficult to make a mistake.

G. A. T. M.

Tenancy.

DELA writes: "A certain house is under lease for three years, and the option of a further period of six years, with the exception of a room facing the street and another room at the rear, which are let under a yearly tenancy expiring next March. Since the granting of the lease the property has changed hands, the present owners wishing to convert the front room into a shop, thus making it necessary to have the use of the room above for a week. The lessee, however, refuses to allow us the use of the room over, and further will not meet us even to discuss matter of compensation. No mention is made in the lease of any suggestion to turn the premises into a shop. (1) What course would you suggest we should adopt? (2) Can the lessee be compelled to allow the owners to enter his room for such purposes?"

Unless there is some clause in the lease—as I fear is unlikely—enabling the lessor to enter for such a purpose, the owner cannot disturb the lessee in the way suggested; the property is in fact his (subject to the reservations in the lease) until the end of his term. The fact that the personality of the lessor has changed does not affect the matter in the least, and I can only suggest that you should appeal to the lessee's good feeling, and should endeavour to induce him to accept reasonable compensation for the disturbance to which he will be subjected. F. S. I.

Rooms Partly in Roof.

DERBY.—ARCHITECT writes: "The by-laws of an urban district council in whose district I am doing some work stipulate that 'every person who shall erect a new building and shall construct any room therein so that it may be used for human habitation, shall comply with the following requirements:—If such a room is not an attic or a room wholly or partly in the roof of such building he shall so construct such room that it shall be not less in height than 9ft. in any part thereof. If such room is an attic, or a room wholly or partly in the roof of such building, he shall construct such room so that it shall be not less in any part than 5ft. in height, and so that it shall not be less than an average height of 8ft. to the extent of half the superficial area of the floor.' In administering this by-law the council insist that every room on the first floor, even of cottages let at 5s. 6d. per week, shall be 9ft. high throughout. I am not allowed to drop the wall-plate in any way, and the ceiling must be flat. It seems to me that this is going further than the Act ever intended. The council do not consider that rooms on the first floor can be put 'partly in the roof.' What is your opinion?"

The council is undoubtedly in the wrong, and there is nothing in the by-laws to prevent the building of a one-storey, two-storey or three-storey house. You may of course choose to build a house of ground and first floor only, and may certainly put the bedrooms "partly in the roof of such building." F. S. I.

A MODEL BAKERY.

A MODEL bakery at Stirchley, near Birmingham, has just been completed for the Ten-Acres and Stirchley Co-operative Society, from designs by Mr. Francis B. Andrews, A.R.I.B.A., of Birmingham. The building consists of a main block of three storeys, the top floor being used for flour stores, the second for the general machinery for flour-mixing, dough-dividing, cake machines, &c. (with a portion screened off and specially heated for dough proving), and on the ground floor for the bakery and the ovens, two of which only are put in as yet, though space remains for two more; they are Baker & Sons' patent draw-plate, double-decker continuous pattern, costing £350 each. Adjoining the main block is, on the north, the oven block, with a stoking passage at the rear of the ovens and a fuel store; while on the east side is the entrance and staircase, off which are bathrooms, men's mess-room, &c. Floor loads have been taken off the walls and conveyed to the concrete footings direct by a system of steelwork built into the walls. For this and the floor girders the new wide-flange heavy-section "Differdange" beams have been employed, those for the main spans bearing 38ft. and being placed in bays at 10ft. centres. The floors are of concrete reinforced with steel angle-iron and wire mesh and rods, and finished with granolithic paving. The cost of the work has been £3,400 (exclusive of ovens). It has been carried out by Mr. W. Harvey Gibbs, builder, of King's Heath, Birmingham, the steelwork being by Mr. Frank W. Suffield, of Birmingham.

Keystones.

M. Rodin is to prepare a bust of Mr. Balfour: but the great work which he has now in hand is a life-size figure of Joan of Arc

New Baptist Church and Schools at Rugby are being built in St. Andrew's Street from designs by Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines, 5, Clement's Inn, Strand, W.C. The church will accommodate about 760 persons, and the school about 800. The contract (£5,881) has been let to Messrs. Linnell & Son, of Rugby.

Students to decorate South Kensington Museum.—The students of the Royal College of Art are to have an opportunity of participating in the decoration of the new buildings of the Victoria and Albert Museum. Those of the modelling school will be allowed to submit sketches for four of the statues which are required, and if approved these will be carried out by them under the direction of Professor Lantéri.

Architects' Assistants wanted for Chicago.—An architect practising in Chicago asks the secretary of the Institute to put him into confidential communication with some good scholarly architectural assistants, from twenty-five to thirty-five years of age, who are Associates of the R.I.B.A. Chicago architects, he states, suffer from the scarcity of assistants, especially those with good English training, who are always welcome in Chicago offices. Familiarity with American methods of building is quickly acquired. Applications should be addressed to the secretary, R.I.B.A., 9, Conduit Street, W.

Association of Teachers in Technical Institutes: Building Section.—At the first ordinary meeting held on March 11th at the Regent Street Polytechnic (presided over by Mr. Hugh Davies, head of the Architectural and Building Trades' Department, Northern Polytechnic) a paper on "The Training of a Craftsman" was read by Mr. E. L. Bates, of the L.C.C. School of Building, Brixton, S.W. The paper reviewed the past training of the craftsman as set forth in the charters of several of the city companies, emphasized the entire lack of any systematic training at the present time, the difficulties of teachers and students under present conditions, and made suggestions for the efficient training of future craftsmen. Discussion of the paper was adjourned to the next meeting of the section, which will be held on April 1st.

Manchester Infirmary Site.—Two or three years ago, when it was decided to build a new infirmary at Manchester, and when the Corporation decided to purchase the site of the old infirmary, suggestions were put forward as to how the site might be utilized. The two chief of these were either to leave the site as an open space or to erect upon it a combined art gallery and reference library, the existing art gallery and reference library being inadequate. This latter scheme is now under consideration by a special committee of the Corporation. For his own delectation Mr. Paul Ogden, F.R.I.B.A., has prepared sketch plans, sections, elevations and perspectives of a building of a monumental character, and suitable for an art and sculpture gallery, museum, loan and reference library, reading and newspaper rooms, and municipal council-chambers.

Birmingham Architectural Association.—At the meeting held on March 3rd Mr. Arthur T. Bolton, A.R.I.B.A, read a paper on Ingram House, a residential club for young men in the South of London, arrangements to visit which are now being made by the Association. On March 10th a special general meeting was held, when Mr. A. W. S. Cross, M.A., and Mr. George Hubbard, F.S.A., read papers on architects' registration. A discussion followed, Mr. J. L. Ball, vice-president, speaking in support of the movement, while

Mr. C. E. Bateman proposed an amendment that registration was inadvisable. Finally a resolution was carried approving the general principle advocated and wishing Messrs. Cross and Hubbard every success in their endeavours to bring about, through the most appropriate channels, suitable legislation upon the subject.

Fleet Street is proposed to be widened to 60ft. between Nos. 53, 68 and 69.

The new War Office is expected to be ready for occupation in about twelve months' time.

The Carpenters' Company has voted the sum of twenty-five guineas towards the Architectural Association Building Fund.

A new Congregational Chapel at Pontypool has been erected at a cost of about £6,700. The architects were Messrs. Swash & Bain, of Newport.

Mr. Edwin J. Dod, of Birkdale, has been appointed architectural assistant on the staff of the Director of Public Works for British East Africa.

New Schools in Guernsey are to be erected at a cost of £10,000 from designs by Mr. Frank Whitmore, of Chelmsford. Accommodation will be provided for about 800 children.

A new Police-court and Station has been erected near the southern end of the Tower Bridge. It has a granite base and upper parts of Portland stone and red brick. There are two courts. The floors of the cells are of asphalt, and the walls have high dadoes of glazed brick. The architect of the building was Mr. J. Dixon Butler. The cost has been about £45,000.

Cardiff, South Wales and Monmouthshire Architects' Society.—At the annual dinner held last week at Cardiff, Mr. John Belcher, A.R.A., P.R.I.B.A., presented a gold badge of office to the president, Mr. C. James, who presented Mr. Belcher with a jewel as a memento of the occasion. The badge is the gift of Lord Windsor, Lord Tredegar and Sir W. T. Lewis. Mr. A. W. S. Cross and Mr. George Hubbard read papers on registration before the Society last week.

Nelson Library Competition.—The award of the assessor (Mr. Willoughby) on the designs submitted for a Carnegie public library at Nelson, to cost £7,000, is as follows:—First premium (£50), Messrs. W. Brandeth Savidge and J. R. Poyser, Nottingham; second (£25 each), Mr. David Bird, Manchester, and Mr. G. Fox, London; third (£15), Mr. T. Rees, Liverpool. It will be noticed that an extra second prize was awarded. More than 200 designs were received.

Royal Academy Prize Competitions.—The subject for the gold medal and travelling studentship of £200 for historical painting—the blue riband of the Academy schools—is "Ulysses recognized by the Nurse, Euryclea." Competing pictures must be on canvases 4ft. 2ins. by 3ft. 4ins., and the principal figure must be not less than 2ft. high. The subject for the gold medal and travelling studentship in sculpture is "Prometheus bound to the Rock in the presence of Force and Strength," the model to consist of two or more figures, the principal one to be 3ft. high. In the similar competition for architecture the subject is a "Design for a British Embassy in a Foreign Capital." "Commerce" is the subject of the competition for a prize of £40 for the best design in water-colour or tempera for the decoration of a portion of a public building. The competition for this prize is always keen, as it carries with it the chance of executing the design at the expense of the Royal Academy. The wall-paintings in the refreshment-room at Burlington House were executed by successful students in this competition.

Right of Way at Stonehenge. — The Attorney-General is bringing an action against Sir Edmund Antrobus for the removal of the fences and obstructions placed across certain highways upon Stonehenge Down, in Wiltshire. The case will come before Mr. Justice Farwell on March 28th.

The famous Tower of Galileo, which for centuries has been so conspicuous an object on the beautiful hill of Arcetri above Florence, is now practically destroyed. For some months past it has been concealed by scaffolding set up with the object of adding one-third to its height, of placing in its walls two new tiers of windows, of adding a loggia, and, in short, of converting the world-famous "Star Tower" into a pretentious modern erection to serve the purpose of a café-restaurant.

The Rhodes Memorial.—After much discussion the Rhodes Memorial Committee have decided that the memorial shall be erected on the Groot Schuur estate, on a projecting ledge on the slope of the mountain. The front of the memorial is to take the form of a bastion with steps on either side, while in the centre of the platform, upon a pedestal, it is hoped that it may be possible to place the famous equestrian group by the late Mr. G. F. Watts, R.A., in bronze, known as "Physical Energy." At the back or mountain side it is proposed to build a peristyle or colonnade to form a suitable architectural background to the central work, and around the pedestal to place bronze panels illustrating episodes in Rhodes's life.

Builders' Notes.

Messrs. W. Summerscales & Sons, Ltd., of Phœnix Foundry, Keighley, have been selected to supply the laundry machinery to the King's Sanatorium at Midhurst.

Employment in the Building Trades continued dull during February. On the whole it showed little change as compared with a month ago, but in certain districts a slight improvement was apparent. It was worse than a year ago.

London Building Acts Amendment Bill.—At last week's meeting of the London County Council, Dr. Napier, chairman of the Building Act Committee, said that "in order to avoid a fight on the second reading, all the Bill, with the exception of the fire clauses, is to be dropped." Accordingly the Bill was read a second time in the House of Commons on Tuesday, March 14th, and referred to a Select Committee.

CHEAP COTTAGES EXHIBITION.

THE Committee of the Exhibition of Cheap Cottages to be held at Letchworth, Hertfordshire, in July, announce that prizes to the value of £100 will be given in each class of the building competitions, *i.e.*, for detached cottages, pairs, groups, &c., built at a cost not exceeding fixed sums. There will also be a special prize of £100 for the best and cheapest all-round cottage suitable for an agricultural labourer, and there will probably be a further substantial prize for the best cottage of concrete. The Committee will consider plans for cottages to be built at the exhibition if received before April 15th, but competitors are urged to send them at once (Saturday next was advertised as the final day) for their own advantage, since more than fifty of the best sites are already allotted, and also in order that they may not be handicapped by beginning to build later than others. The funds of the exhibition have steadily increased through the generosity of the public, but the Committee are still open to receive donations which will make the prizes more numerous and substantial.

Current Market Prices.

FORAGE.		£	s.	d.	£	s.	d.
Beans	per qr.	1	8	0	1	10	0
Clover, best	per load	3	15	0	4	2	6
Hay, good	do.	3	10	0	3	15	0
Sainfoin mixture ...	do.	3	10	0	3	17	6
Straw	do.	1	12	0	2	0	0
OILS AND PAINTS.							
Castor Oil, French ...	per cwt.	1	0	5		—	
Colza Oil, English ...	do.	1	3	0		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0		—	
Linseed Oil, barrels ...	per cwt.	0	17	$1\frac{1}{2}$		—	
Petroleum, American ...	per gal.	0	0	$5\frac{1}{8}$	0	0	$5\frac{3}{8}$
Do. Russian ...	do.	0	0	$4\frac{3}{4}$		—	
Pitch	per barrel	0	8	0		—	
Shellac, orange	per cwt.	7	5	0	7	10	0
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	4	0		—	
Tar, Stockholm	per barrel	1	6	6		—	
Turpentine	per cwt.	1	18	0		—	
METALS.							
Copper, sheet, strong ...	per ton	82	0	0		—	
Iron, Staffs., bar ...	do.	5	17	6	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	2	6	10	5	0
Lead, pig, Soft Foreign...	do.	12	8	9		—	
Do. do. English common brands	do.	12	13	9		—	
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14	0	0		—	
Do. pipe	do.	15	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	5	0		—	
Do. floor brads... ...	do.	9	0	0		—	
Steel, Staffs., Girders and Angles	do.	5	5	0	6	0	0
Do. do. Mild bars ...	do.	6	0	0	6	5	0
Tin, Foreign	do.	135	7	6	135	17	6
Do. English ingots ...	do.	135	10	0	137	0	0
Zinc, sheets, Silesian ...	do.	28	0	0		—	
Do. do. Vielle Montaigne	do.	29	0	0		—	
Do. Spelter	do.	23	15	0	24	0	0
TIMBER.							
Soft Woods.							
Whitewood, American, logs.	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	3	0
Fir, Dantzic and Memel	per load	2	7	6	4	15	0
Pine, Quebec, Yellow ...	do.	4	5	0	7	5	0
Do. Pitch, American...	do.	2	8	0	5	15	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, St. Petersburg, Yellow, 1st, 3×11	per std.	16	10	0			
Do. do. do. do. 3×9	do.	11	10	0		—	
Do. do. do. 1st and 2nd, 2½×11	do.	10	0	0		—	
Do. do. do. Unsorted, 3×9	do.	10	5	0		—	
Do. do. White, 1st, 3×11	do.	10	10	0		—	
Do. do. do. Unsorted, 2½×7	do.	8	5	0		—	
Do. Archangel, Yellow, 2nd, 3×9	do.	15	0	0		—	
Do. do. do. 3rd, 3×9	do.	11	10	0		—	
Do. Umba, Yellow, 4th, 3×9	do.	9	0	0		—	
Do. Nederkalix, Yellow, 1st, 3×7	do.	10	0	0		—	
Do. Langror, Yellow, 4th, 2½×7	do.	9	5	0		—	
Do. Bure and Sandvik, Yellow, 1st, 2½×7	do.	10	0	0			
Do. Ingramport, Yellow, Unsorted, 2½×7	do.	8	5	0		—	
Do. Quebec, Spruce, 2nd, 3×9	do.	9	15	0		—	
Do. do. do. 3rd, 3×9	do.	8	5	0	9	0	0
Do. do. do. do. 3×7	do.	7	10	0		—	
Do. do. do. 4th, 3×9	do.	8	0	0		—	
Do. Montreal, Spruce, 3rd, 3×9	do.	8	10	0	8	15	0
Do. Amherst, Spruce, Unsorted, 3×7	do.	7	5	0		—	
Battens, all kinds ...	do.	6	5	0	13	10	0
Flooring Boards 1in. prepared, 1st... ...	per square	0	9	0	0	10	9
Do. 2nd	do.	0	9	3	0	10	0
Do. 3rd, &c.	do.	0	6	0	0	7	9
Hard Woods.							
Ash, Quebec	per load	4	0	0	7	10	0
Birch, New Brunswick...	do.	2	10	0	5	5	0
Do. Quebec do. ...	do.	2	10	0	6	0	0
Box, Turkey	per ton	7	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	$3\frac{1}{2}$		—	
Do. Honduras ...	do.	0	0	$3\frac{1}{2}$		—	
Do. Tobasco	do.	0	0	$4\frac{25}{32}$		—	
Elm, Quebec	per load	4	2	6	8	15	0
Jarrah, planks	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras...	per ft. sup.	0	0	$4\frac{11}{16}$		—	
Do. African ...	do.	0	0	$2\frac{11}{32}$		—	
Do. St. Domingo	do.	0	0	4		—	
Do. Cuba ...	do.	0	0	$5\frac{1}{4}$		—	
Do. Lagos ...	do.	0	0	4		—	
Do. Benin ...	do.	0	0	$2\frac{21}{32}$		—	
Do. Tobasco ...	do.	0	0	$5\frac{13}{16}$		—	
Oak, Wainscot	per log.	2	12	6	5	15	0
Do. American quartered, planks and boards	per ft. cu.	0	2	6	0	5	0
Do. Dantzic & Stettin	per load	3	0	0	6	10	0
Do. Quebec	do.	4	15	0	8	0	0
Teak, Rangoon, planks...	do.	8	0	0	15	10	0
Do. Indian logs ...	do.	10	0	0	18	10	0
Do. Indian planks ...	do.	13	0	0	20	0	0
Do. Moulmein logs ...	do.	6	10	0	8	0	0
Kauri pine logs	per ft. cu.	0	1	6	0	2	0
Do. do. planks ...	do.	0	3	0	0	3	6

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
March 23	Sprowston, Norfolk—School	County Council	C. J. Brown, Cathedral Offices, The Close, Norwich.
,, 23	Winton, near Bournemouth—Chapel	Primitive Methodist Connexion	T. E. Grimes, 71 Talbot Road, Winton.
,, 24	Pishill, near Henley-on-Thames—Hospital	Smallpox Hospital Board	C. Clements, 36 Market Place, Henley-on-Thames.
,, 24	Merthyr, Wales—Rebuilding 91 High Street	Mr. J. Reynolds	C. M. Davies, 112 High Street, Merthyr.
,, 24	Swanton Rovers, Norfolk—Alteration to School	Education Committee	A. J. Lacey, 6 Upper King Street, Norwich.
,, 24	Poole—school Building	Strood R.D.C.	W. Andrew, Architect, Parkstone.
,, 24	Washington, Durham—School, &c.	——	Davidson & Phillipson, 32 Clayton Street W., Newcastle-on-Tyne.
,, 25	Ferndale, Wales—Alteration to Men's Club	——	Ferndale Working Men's Conservative Club.
,, 25	Exeter—Institute	——	H. Read, 12 Castle Street, Exeter.
,, 25	Pontrug, Wales—Chapel House	Chapel Committee	Chapel House, Pontrug.
,, 25	Manchester—Supplying and Fixing Tiled Dados	Education Committee	Education Offices, Deansgate, Manchester.
,, 25	Ynishir—Sixty-five Cottages	Standard View Building Club	Teather & Wilson, Andrews' Buildings, Queen Street, Cardiff.
,, 25	Cliffe-cum-Lund, near Selby—Additions, &c., to Schools	Managers	T. S. Ullathorne, Architect, Selby.
,, 27	Manchester—Additions, &c., to Schools	Education Committee	Education Offices, Deansgate, Manchester.
,, 27	Teignmouth—Police-station	Standing Joint Committee	E. H. Harbottle, Queen Street, Exeter.
,, 27	Cudworth—Extension of Shed	Hull and Barnsley Railway Co.	R. Pawley, 9 Charlotte Street, Hull.
,, 27	Tredegar, Wales—Surgery, &c.	——	W. S. Williams, Architect, Tredegar.
,, 27	Widnes—Enlargement of School	Education Committee	F. U. Holme, Westminster Chambers, 1 Crosshall Street, Liverpool.
,, 27	Guildford—Bridge Piers	Rural District Council	J. Austee, Council Offices, Guildford.
,, 27	Hipperholme—Four Houses	——	R. Berry, Commercial Street, Halifax.
,, 28	Portsmouth—New Wing to Hospital	Corporation	Borough Engineer's Office, Town Hall, Portsmouth.
,, 28	Ovenden, Yorks—Pair of Villas	——	W. C. Williams, 29 Southgate, Halifax.
,, 28	Newark—Infectious Diseases Hospitals	Borough Council	G. Sheppard, Town Hall, Newark.
,, 28	Tetbury, Gloucs.—Alterations to Workhouse	Guardians	V. A. Lawson, 17 Rowcroft, Stroud.
,, 28	Llanhilleth, Mon.—School	Education Committee	Swash & Bain, Midland Bank Chambers, Newport, Mon
,, 28	Crigglestone, near Wakefield—Classrooms, &c.	Education Committee	County Hall, Wakefield.
,, 29	London, S.W.—Library	Fulham Borough Council	F. Wood, Town Hall, Fulham.
,, 29	Sheffield—Alterations to Workhouse Hospital	Guardians	H. I. Potter, 24 Norfolk Row, Sheffield.
,, 31	Hereford—Church	——	Nicholson & Hartree, Hereford.
,, 31	Rhostyllen, near Wrexham—Chapel	——	S. Thomas, High Street, Rhostyllen.
,, 31	Whitehaugh, N.B.—Alteration to Stables, &c.	——	James Comfort, Gardener, Whitehaugh.
	ENGINEERING:		
March 23	Peterborough—Waterworks Plant	Corporation	J. C. Gill, Waterworks Engineer's Office, Peterborough.
,, 23	Runcorn—Steel Trough Bridge	Manchester Ship Canal Co.	W. H. Hunter, 41 Spring Gardens, Manchester.
,, 24	Bradford-on-Avon—Pumps, &c.	Urban District Council	A. S. Wootton, Town Hall Chambers, Bradford-on-Avon.
,, 24	Poole—Ferry Boat	Town Council	Town Clerk, Poole.
,, 24	Cardiff—Steam Road Roller	Dinas Powis R.D.C.	M. Warren, Park House, Cardiff.
,, 27	Rathmines, Ireland—Condensing Plant	Urban Sanitary Authority	G. F. Pilditch, Electricity Works, Rathmines.
,, 27	Grindleford and Rowsley, Derby—Aqueduct Works	Derwent Valley Water Board	E. Sandeman, Engineer to Board, Bamford, near Sheffield.
,, 27	Amsterdam—Railway Works	Holland Railway Co.	Central Administration Building of the Holland Railway Co., Droogbak, Amsterdam.
,, 28	Salford—Heating Portion of House	Museum Committee	Borough Engineer's Office, Town Hall, Salford.
,, 29	Great Yarmouth—Condenser	Corporation	Preece & Cardew, 8 Queen Anne's Gate, S.W.
,, 30	Bolton, Lancs—Coolers, &c.	Electricity Committee	A. A. Day, Electrical Engineer, Spa Road, Bolton.
,, 31	Herne Bay—Heating Apparatus	Urban District Council	F. W. J. Palmer, Council Offices, Town Hall, Herne Bay.
,, 31	Hindley, Lancs—Condensers	Gas Committee	H. O. Timmins, Gasworks, Hindley.
,, 31	Shanghai—Electric Tramways	Municipal Council	J. Poor & Co., 63 Leadenhall Street, E.C.
April 1	Lulea, Sweden—Dredging	——	Harbour Office, Lulea, Sweden.
,, 1	Richworth, Yorks—Tank	Urban District Council	Horsfall & Son, 22A Commercial Road, Halifax.
,, 3	Smithston, near Gartly, N.B.—Bridge	District Committee	J. Barron, Central Chambers, 216 Union Street, Aberdeen.
,, 4	Birmingham—Tramway Cars	Tramways Committee	A. Baker, 254A Corporation Street, Birmingham.
,, 10	Glasgow—Electricity Generating Plant	Trustees of Clyde Navigation	T. R. Mackenzie, 16 Robertson Street, Glasgow.
,, 10	St. George's Harbour, Bermuda—Deepening, &c., Channel	Government	Coode & Son & Matthews, 9 Victoria Street, S.W.
May 1	Suakin (Red Sea)—Lighthouse	Ports and Lights Administration	Deputy-Controller-General, Ports and Lights Administration, Alexandria.
	IRON AND STEEL:		
March 23	Brixham, Devon—Cast-iron Shields, &c.	Urban District Council	J. L. Arlidge, Town Hall, Brixham.
,, 23	Aston Manor—Iron Castings, &c.	Public Works Sub-Committee	G. H. Jack, Council House, Aston Manor.
,, 25	Waterloo, Lancs—Iron Pipes	Urban District Council	F. S. Yates, Town Hall, Waterloo.
,, 27	Welwyn, Herts—Pipes	Rural District Council	H. Walker & Son, Albion Chambers, King Street, Nottingham.
,, 27	Clayton-le-Moors—Ironwork	Urban District Council	A. Dodgeon, Surveyor, Clayton-le-Moors.
,, 27	Ilfracombe—Iron Water Mains	Urban District Council	O. M. Prouse, Town Hall, Ilfracombe.
,, 27	Glasgow—Steelwork	Caledonian Railway Co.	Company's District Engineer, 6 Germiston Street, Glasgow.
,, 29	Sutton, Surrey—Ironmongery	Urban District Council	C. Chambers Smith, Municipal Offices, Sutton.
,, 29	Amsterdam—Cast-iron Supporting Pots	Board of Trade	Mart. Nyhoff, The Hague.
,, 29	Dorchester—Ironmongery	Town Council	Borough Surveyor, Dorchester.
,, 31	Harwich—Pipes	Gas and Coke Co.	G. Baines, Secretary, Harwich.
April 3	Verulam, Natal—Pipes	Local Board	G. B. Laffan, Hardy's Chambers, Printing Office St., Pietermaritzburg.
	PAINTING AND PLUMBING:		
March 23	Bromyard—Oils, &c.	Rural District Council	R. O. Smith, District Surveyor, Bromyard.
,, 29	Dorchester—Oils, &c.	Town Council	Borough Surveyor, Dorchester.
April 13	London, S.E.—Painting Interior & Exterior of Worhhouse	Guardians	E. P. Fenton, 283 Tooley Street, S.E.
	ROADS AND CARTAGE:		
March 23	Aston Manor—Roadstone	Public Works Sub-Committee	G. H. Jack, Council House, Aston Manor.
,, 23	Witney, Oxon.—Road Materials	Rural District Council	G. Wallis, Brampton, Oxon.
,, 23	Eastry, Kent—Flints, &c.	Rural District Council	J. W. Watson, Brook Street, Eastry.
,, 23	Gateacre, near Liverpool—Macadam	Little Woolton U.D.C.	R. Simmons, Grange Lane, Gateacre.
,, 23	Lanchester—Road Materials	Rural District Council	W. Cumming, Lanchester, Durham.
,, 23	London, W.C.—Paving Works	Westminster City Council	Works Department, Westminster City Hall, Charing Cross Road, W.C
,, 23	Peterborough—Road Materials	City Council	J. W. Walshaw, Guildhall, Peterborough.
,, 23	Stockport—Road Widening	General Purposes Committee	J. Atkinson, Borough Surveyor, Stockport.
,, 24	Norden, Lancs—Road Materials	Urban District Council	J. W. Sunderland, Church View, Sunderland.
,, 24	Pentre, Rhondda, Wales—Street Works	Urban District Council	Public Offices, Pentre.
,, 24	Leek, Staffs—Granite Setts	Paving and Sewering Committee	W. E. Beacham, Town Hall, Leek.
,, 25	Hayward, Lancs—Flags, &c.	Corporation	J. A. Settle, Borough Engineer, Haywood.
,, 25	Ramsey, Hunts—Broken Granite	Urban District Council	R. F. Serjeant, Clerk, Ramsey, Hunts.
,, 25	Repton, Burton on-Trent—Road Materials	Rural District Council	C. F. Chamberlain, Union Offices, Burton-on-Trent.
,, 25	East Grinstead—Road Materials	Urban District Council	W. E. Woolan, Council Offices, London Road, East Grinstead.
,, 25	Driffield, Yorks—Road Materials	Rural District Council	T. C. Beaumont, Driffield.
,, 25	Alderley Edge, Cheshire—Street Works	Urban District Council	H. Sheldon, Council Offices, Alderley Edge.
,, 27	Guildford—Street Works	Rural District Council	J. Anstee, District Council Offices, Guildford.
,, 27	Ynysybwl, Wales—Paving, &c.	Mountain Ash U.D.C.	W. D. Thomas, Council Offices, Mountain Ash.
,, 27	East Moseley—Granite, &c.	Urban District Council	Surveyor, District Council Offices, East Moseley.
,, 27	Clayton-le-Moors—Granite, &c.	Urban District Council	A. Dodgeon, Surveyor to Council, Clayton-le-Moors.
,, 28	Westbury, Wilts—Road Materials	Urban District Council	F. Jenkins, Laverton Institute, Westbury.
,, 28	West Malling, Kent—Road Materials	Rural District Council	J. Marshall, Surveyor, West Malling.
,, 28	Milnrow, Lancs—Road Materials	Urban District Council	W. A. Foster, Clerk, Milnrow.
,, 28	Finedon, Northants—Granite	Excelsior Patent Stone Co.	Company's Offices, 10 George Street, Kettering.
,, 29	Gainsborough—Road Materials	Urban District Council	Engineer and Surveyor, Council Offices, Gainsborough.
,, 29	London, S.W.—Making-up Road	Fulham Borough Council	F. Wood, Town Hall, Fulham.
,, 29	Oxford—Road Materials	Corporation	W. A. White, City Engineer, Oxford.
,, 30	Chatham—Road Materials	Town Council	C. Day, Town Hall, Chatham.
April 3	Brierfield, Burnley—Paving, &c., Street	Urban District Council	B. Halstead, Town Hall, Brierfield.
,, 3	London, S.E.—Kerbing, &c.	Lewisham Borough Council	Surveyor's Department, Town Hall, Catford.
,, 4	Epsom—Road Materials	Rural District Council	T. E. Ware, Surveyor to Council, Waterloo Road, Epsom.
,, 5	Hove, Sussex—Tar Paving	——	H. H. Scott, Borough Surveyor, Town Hall, Hove.
,, 10	Magor, Wales—Metalling	Rural District Council	Union Offices, Queen's Hill, Newport, Mon.
,, 10	St. Mellon's, near Newport—Road Metalling	Rural District Council	Union Offices, Queen's Hill, Newport, Mon.

Complete List of Contracts Open.—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	SANITARY:		
March 23	Radcliffe, Lancs—Sewerage Works	Urban District Council	W. L. Rothwell, Council Offices, Radcliffe.
,, 24	Stockport—Disinfectant Fluid and Powder	Cleansing Committee	Cleansing Superintendent's Office, Portwood Stables, Stockport.
,, 25	Gillingham, Kent—Disinfectants, &c.	Town Council	J. L. Redfern, Corporation Offices, Gillingham, Kent.
,, 27	East Moseley—Sanitary Pipes	Urban District Council	Surveyor, District Council Offices, East Moseley.
,, 27	Tanfield, Durham—Scavenging	Urban District Council	R. Heslop, Burnopfield.
,, 28	Glasgow—Sewers	Corporation	City Engineer, City Chambers, 64 Cochrane Street, Glasgow.
,, 28	Shere, Surrey—Sewerage Works	Guildford R.D.C.	W. S. O. Cullerne, Commercial Road, Guildford.
,, 29	London, S.E.—Removal of Refuse	Trustees of Borough Market	Market Offices, Cathedral Street, Southwark.
,, 31	Featherstone, Yorks—Sewage Works	Urban District Council	Council Offices, Featherstone.
April 5	Middleton, Lancs—Sewers	Corporation	W. Welburn, Town Hall, Middleton.
,, 10	Norton, Sheffield—Emptying Ashpits	Rural District Council	T. Smith, Clerk, The Edge, Sheffield.
	TIMBER:		
March 25	Gillingham, Kent—Timber	Town Council	J. L. Redfern, Corporation Offices, Gillingham.
,, 28	London, N.—Deal Ends	Guardians	E. Davey, Clerk, Guardians' Office, St. John's Rd., Upper Holloway, N.
April 3	Cape Town—Hardwood Sleepers and Timber	Commercial Intelligence Branch of Board of Trade.	Offices of Commercial Intelligence Branch of Board of Trade, 73 Basinghall Street, E.C.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
March 30	London, S.W.—Municipal Buildings	——	£1	H. J. Smith, Town Hall, Kennington, S.W.
,, 31	Chippenham—School	£30 & £20	——	W. Pullinger, Education Department, County Offices, Trowbridge.
,, 31	London, S.E.—Clock Tower	£20, £15 & £10	——	Thomson & Pomeroy, 49 Hill Road, Wimbledon.
,, 31	Trowbridge—School	£30 & £20	——	W. Pullinger, Education Department, County Offices, Trowbridge.
April 5	Maesteg, Wales—Chapel	——	——	W. G. Roberts, Secretary, Llysderfel, Maesteg.
,, 17	Cardiff—Libraries	£75 & £50	——	Chief Librarian, Central Libraries, Cardiff.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

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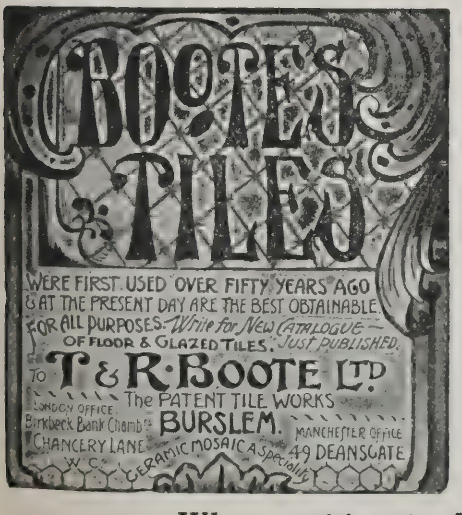
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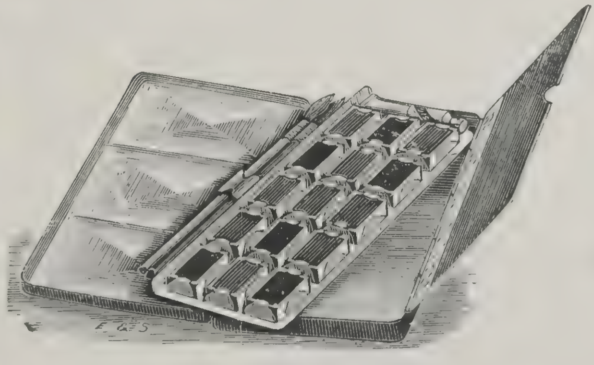

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March 24th. Ordinary General Meeting, 18, Tufton Street, Westminster, S.W., 7.30 p.m. Paper by Mr. A NEEDHAM WILSON, A.R.I.B.A., on "Sketch Plans and Working Drawings." Nomination of Officers for Session 1905-1906.

March 25th. Fifth spring visit to the Shipping Offices, Cockspur Street, Mr. HENRY TANNER, Jun., Architect. Members to meet at the building at 2 p.m. A visit will afterwards be paid to the new Government Buildings, Parliament Street, by kind permission of Sir HENRY TANNER. Members to meet at the corner of Parliament Street and Great George Street at 3.30 p.m.

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See p. xxii *for the Employment Register.*

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Competitions Open.

BOROUGH OF SWINDON.

COMPETITIVE PLANS FOR PUBLIC ELEMENTARY SCHOOL.

The Education Committee of the Town Council of Swindon propose to erect a PUBLIC ELEMENTARY SCHOOL, with accommodation for 840 scholars, and invite PLANS from architects.

A block plan of the site, together with conditions and instructions, may be obtained from Mr. W. SEATON, Secretary to the Education Committee, Education Office, Town Hall, Swindon.

No premium is offered, but the author of the selected Plans will be entrusted with the carrying out of the work at a commission of £5 per cent.

Plans to be delivered by 14th APRIL, 1905

ROBERT HILTON,
Town Clerk.

Town Hall, Swindon,
2nd March, 1905.

Contracts Open.

BOROUGH OF KEIGHLEY.

BRICK SEWER.

The Special Drainage Committee invite tenders for the construction of about 575 yards of eggshaped and circular brick sewer. Tenders to be received by the 4th April. Full particulars from the undersigned.

W. H. HOPKINSON, A.M.I.C.E.,
Borough Engineer.

SKETTY, SWANSEA

TO BUILDERS AND CONTRACTORS.

The Trustees of the Coedsaeson Building Club are prepared to receive Names of Persons willing to TENDER for the ERECTION of about 10 PAIRS OF VILLAS, according to Plans, Specifications, and Quantities prepared by Mr. B. C. DEACON, Architect, Central Buildings, Liverpool, to whom applications should be sent not later than MARCH 31st, 1905.

W. NICHOLS, Secretary.

TENDERS WANTED for permanent Canvas Erection, as CONCERT PAVILION.—Particulars, &c., on application to PAVILION, Box 1002, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

METROPOLITAN BOROUGH OF FULHAM.

NORTH BRANCH LIBRARY.

The Council of the Borough of Fulham invite TENDERS for the ERECTION of a BRANCH LIBRARY in Lillie Road.

The drawings and specification can be seen at the office of the Borough Engineer and Surveyor, Mr. FRANCIS WOOD, A.M.I.C.E., F.G.S., Town Hall, Fulham, S.W. Quantities will be supplied to each person tendering on the deposit of three guineas, which will be returned on the receipt of a bonâ-fide Tender.

The Contractor will be required to sign a declaration that he pays the Trade Union rate of wages, and observes the hours of labour recognised in the London district as applying to the several trades employed on the works.

Sealed Tenders endorsed "North Branch Library" are to be delivered to my office before 7 o clock p.m., on Wednesday, the 29th MARCH, 1905. The lowest or any Tender will not necessarily be accepted.

R. M. PRESCOTT,
Town Clerk.

Town Hall, Fulham.

Privileges open to all Regular Readers of the "Builders' Journal."

I.—Free Monthly Advertisements.

1. A Free Advertisement of 12 words in the Wanted or Miscellaneous Advertisement Columns, in one issue of the BUILDERS' JOURNAL during each calendar month will be given to any regular reader.
2. The charge of one penny will be made for each additional word.
3. Advertiser's Name and Address or Box Number must be counted, but will in no case be reckoned as more than five words.
4. All advertisements must be accompanied by the correct remittance, and should a receipt be required a stamped addressed envelope must be enclosed.
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II.—Free Answers to Enquiries.

1. The services of a large staff of experts are at the disposal of all regular readers who require information on architectural, constructional or legal matters.
2. Questions should in all cases be addressed to the Editor, and be written on one side of the paper only.
3. Correspondents are particularly requested to be as brief as possible.
4. The querist's name and address must always be given, not necessarily for publication

Note.—Owing to the large number of enquiries we receive weekly, we are compelled to restrict the advantages of this department to Regular Readers.

III.—Free Accident Insurance of £500.

1. Every regular reader of the BUILDERS' JOURNAL is entitled to the benefit of this Insurance.
2. A Pamphlet giving full details of this and other Insurance schemes inaugurated by the BUILDERS' JOURNAL for the benefit of its readers, and guaranteed by "The Ocean Accident Corporation, Limited," will be sent on application.

What is a Regular Reader?

We have employed the term "Regular Reader" throughout these announcements as the description "subscriber" is often understood to mean one who subscribes direct to the publishing office.

We mean by a Regular Reader anyone who has placed an order with us or any newsagent or bookstall for the BUILDERS' JOURNAL for one year.

Those readers who order the BUILDERS' JOURNAL through their local newsagent or bookstall should send us the newsagent's receipt. Their names will then be placed on our subscribers' list, and they will be entitled to all the advantages set out above.

5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS.
OFFICE: 6, GREAT NEW STREET, FETTER LANE, E.C.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, F.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Aberystwyth.—For completing the nave and building a tower, &c., to St. Michael's Church. Messrs. Nicholson & Hartree, architects and surveyors, Hereford. Quantities supplied :—

S. Bastow & Co., Bristol	£7,808	7	11
E. E. Jenkins	7,300	7	6
Jones & Lewis	7,236	2	6
E. Owen	6,754	5	9
C. Cooke, Hereford	6,636	11	10
J. & W. Edwards, Shrewsbury	6,392	3	6
Beaven & Hodges, Hereford	6,347	6	8
Edwards Brothers	6,076	0	0
Treasure & Son, Shrewsbury	6,012	8	9
L. Bearne	5,977	3	9
H. Smith, Kidderminster	5,949	0	0
Humphrys & Williams*	5,672	14	9
J. Rathbone, Northwich	5,643	17	6
T. Hopkins & Co.	5,132	0	0

* Amended and accepted. [Rest of Aberystwyth.]

Alverstoke.—For new drainage and additional buildings at the children's home in Clayhall Lane. Messrs. Holman & Goodrham, architects, 6, King's Bench Walk, Temple, London, E.C. :—

W. R. Light & Son, Portsmouth	£2,790	0	0
T. E. Gibbons, Gosport	2,600	0	0
S. Kavanagh & Co., Surbiton Hill	2,465	18	9
J. S. Kimberley, Banbury	2,373	0	0
Lear & Son, Alverstoke	2,348	0	0
W. Dugan, Portsea	2,268	16	0
J. Hunt, Gosport	2,069	0	0
G. Hughes,* Wokingham	1,941	4	11

* Accepted.

Conway.—For the construction of a pumping station, concrete service reservoir and appurtenant works at Llysfaen, for the Conway R.D.C. Mr. T. B. Farrington, A.M.I.C.E., surveyor, Trinity Square, Llandudno :—

Underwood Brothers, Dukinfield	£7,543	0	0
H. Roberts, West Bromwich and Colwyn Bay	7,421	8	0
W. Westwood, Bromyard, near Worcester	7,321	11	4
Rowell & Sons, Chipping Norton	7,149	6	11
Sheffield & Evans,* Rhyl	6,669	12	6

* Accepted.

Ditchling (Sussex). — Accepted for sewerage and sewage-disposal works, for the Chailey R.D.C. Messrs. Beesley, Son & Nichols, MM.I.C.E., engineers, 11, Victoria Street, Westminster, S.W. :—

Norman & Burt, Burgess Hill, Sussex ... £3,330

Dorchester.—For the erection of a new post-office, for the Commissioners of H.M. Works and Public Buildings :—

				A.		
F. Hoare & Sons	£8,768	0	0	£8,888	0	0
Pethick Brothers	7,244	0	0	7,209	0	0
F. Merrick & Son	6,544	0	0	6,544	0	0
H. Stevens & Co.	6,288	0	0	6,198	0	0
Jesty & Baker	6,228	12	0	6,278	12	0
Wort & Way	6,199	0	0	6,179	0	9
C. E. Slade	6,177	0	0	6,163	0	0
Ham Hill & Doulting Stone Co., Ltd.	6,126	0	0	6,129	0	0
Wakeham Brothers	5,995	0	0	5,973	0	0
Mussellwhite & Sapp	5,990	0	0	5,978	0	0
R. Davis & Son	5,949	7	0	5,823	0	8
Bird & Pippard	5,850	0	0	5,832	0	0
J. Long & Sons	5,777	0	0	5,782	0	0
H. Pittard & Sons	5,626	0	0	5,626	0	0
J. J. Lovell	5,625	0	0	5,605	0	0
East & Hyde	5,599	0	0	5,587	18	0
A. J. Colborne	5,494	0	0	5,478	3	0
J. W. & H. Childs*	5,407	0	0	5,387	0	0

Credit for old materials :—A. J. Colborne, £4; Ham Hill & Doulting Stone Co., £10; F. Merrick & Son, £5; Pethick Brothers, £4.

A.—Alternative tender for Shamrock stone:—

* Accepted.

Gillingham (Dorset).—For the erection of two houses in Newbury, for the Gillingham Baptist Church Trustees. Messrs. Hudson & Martin, architects, Gillingham :—

F. Davis, Shaftesbury	£549	0	0
S. Read, Gillingham	512	0	0
E. Harris, junior, Gillingham	495	0	0
C. Barnes, Gillingham	494	0	0
H. A. Barnes, Gillingham	490	0	0
Bracher Brothers,* Gillingham	459	18	0

* Accepted.

Glaisdale, near Whitby.—For the erection of a pair of semi-detached villa residences. Mr. Edward H. Smales, A.R.I.B.A., architect, 5, Flower Gate, Whitby :—

J. Kidd	£2,789	16	0
T. R. Fletcher	2,780	0	0
Coverdale & Longhorn	2,764	16	0
J. Brain & Sons	2,667	10	0
J. Harrison, Grosmont	2,484	15	0
A. Palframan	2,395	10	0
J. G. Porteous, Guisborough	2,325	9	7
R. Harland*	2,228	13	0

* Accepted. [Rest of Whitby.]

Great Missenden (Bucks).—For the erection of a billiard-room, for Mr. Alfred Dunhill. Mr. J. Bruce Merson, architect, 76, High Road, Kilburn, N.W. :—

M. Dymock	£508	10	0
H. J. Wright	498	0	0
G. Parsons	475	0	0
Aldridge & Son*	404	0	0

* Accepted.

Bromley.—For the erection of a public library in the High Street, for the Town Council. Mr. Evelyn Hellicar, A.R.I.B.A., architect, 10, Serjeant's Inn, E.C. :—

		Additional if Portland stone in lieu of Doulting stone.			Additional if oak wood-block flooring in lieu of maple.		
J. S. Hammond & Son, Romford	£6,355	£160	0	0	£65	0	0
T. Crossley & Son	6,289	164	0	0	60	0	0
J. Hutchings	6,283	288	0	0	56	0	0
J. Ferguson & Co., Tottenham	6,199	180	0	0	79	5	0
J. Quittenton, Warlingham	6,077	169	10	0	50	6	3
R. A. Lowe, Chislehurst	6,049	161	0	0	58	0	0
Gann & Co., Whitstable	5,879	396	0	0	50	0	0
D. Payne	5,871	142	0	0	120	0	0
G. H. Denne & Son, Deal	5,840	185	0	0	55	0	0
J. Podger & Sons	5,800	135	0	0	55	0	0
E. P. Bulled & Co., Croydon	5,756	325	0	0	69	0	0
J. Lonsdale, Swanley Junction	5,754	173	0	0	54	0	0
E. A. Roome & Co., Basinghall Street, E.C.	5,750	150	0	0	50	0	0
J. Shelbourne & Co., Wandsworth	5 743	135	0	0	57	0	0
J. C. Arnaud & Son	5,742	135	0	0	118	0	0
Perry Brothers, London	5,727	90	0	0	79	0	0
W. Nash, Deptford	5,675	85	0	0	50	0	0
Holliday & Greenwood, Ltd., Brixton	5,654	131	10	0	55	0	0
J. Smith & Sons, Ltd., South Norwood	5,555	100	0	0	64	0	0
Waring White Building Co., Ltd., Piccadilly	5,514	130	2	3	64	12	9
J. Parnell & Son, Rugby	5,457	224	10	0	60	0	0
F. P. Duthoit	5,453	161	0	0	52	0	0
W. Lawrence & Son, Waltham Cross	5,450	280	0	0	21	10	0
W. Wallis, Balham	5,399	152	0	0	51	0	0
Jones & Andrews, Beckenham	5,354	220	6	0	18	12	0
Bowman & Sons, Stamford	5,327	290	0	0	19	0	0
B. E. Nightingale, Albert Embankment	5,290	197	0	0	56	0	0
C. Brightman, Watford	5,244	165	0	0	70	0	0
W. J. Renshaw, Putney	5,227	145	0	0	57	10	0
Norman & Burt, Burgess Hill	5,210	175	0	0	52	0	0
A. Hudson & Co.,* Westminster	4,990	288	0	0	57	10	0

* Accepted. [Rest of Bromley.]

[*Continued on page* xx.]

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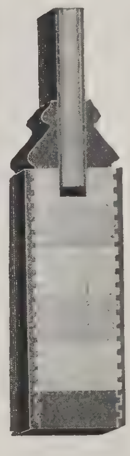

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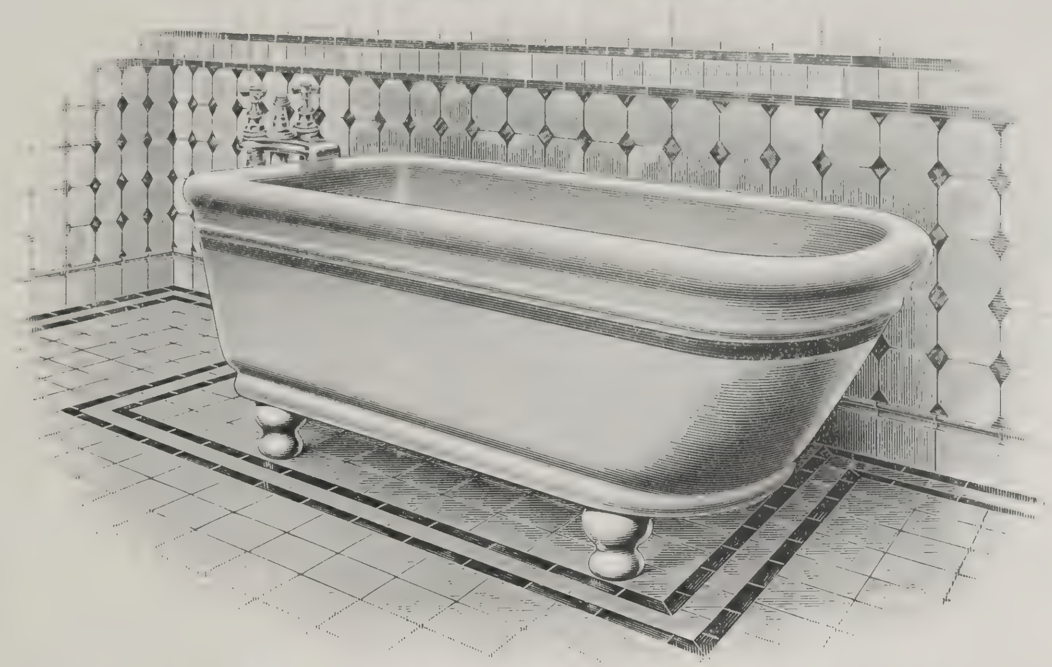

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TENDERS—*cont. from p.* xviii.

Haslemere.—For the erection of a private residence, for Mr. R. C. S. Evennett. Mr. John H. Howard, architect, Haslemere :—

F. Milton, Witby	£2,460	0	0
T. Strut, Northchapel	2,258	3	9
Haslemere Builders	1,910	0	0
D. Fry, Godalming	1,875	0	0
Chapman & Lowry,* Haslemere	1,622	12	6

* Accepted.

Hemel Hempstead.—For the erection of four houses and shops, for Mr. Walter Grover. Messrs. C. H. & N. A. Rew, architects, Great Berkhampstead :—

E. Horn & Son	£2,420
W. Sear	2,410
S. C. Smith	2,275
J. Honour & Son*	2,095

* Accepted.

London, S.E.—For the erection of a residential school for blind children at Elm Court, Norwood :—

H. L. Holloway, Deptford	£2,890	0	0
Enness Brothers, Erith	2,692	6	0
J. F. Ford, Kennington Road	2,633	0	0
Lathey Brothers, Battersea Park	2,577	0	0
W. Downs, Walworth Road	2,569	0	0
J. Appleby & Sons, Lambeth	2,458	0	0
W. Akers & Co., South Norwood	2,403	0	0
J. & C. Bowyer, Upper Norwood	2,379	0	0
Spencer, Santo & Co., Ltd., Westminster	2,369	0	0
W. J. Mitchell & Son, Dulwich	2,340	0	0
W. Johnson & Co., Ltd., Wandsworth Common	2,278	11	9
J. Garrett & Son, 17, Balham Hill	2,268	0	0
E. P. Bulled & Co., Croydon	2,267	0	0
E. Triggs, Clapham	2,250	0	0
J. Marsland & Sons, Walworth	2,224	0	0
J. Smith & Sons, Ltd., South Norwood	2,211	0	0
T. D. Leng, Deptford	2,174	0	0
Holliday & Greenwood, Ltd., Brixton	2,169	0	0

London, N.—Accepted for kerbing, channelling, paving and making-up carriageways at Winchmore Hill, for the Southgate Urban District Council :—

J. Hampton, Broomfield Farm, Palmers Green, N.	£2,713	14	0

London, S.E.—For the erection of a new school at Torridon Road, Lewisham, for the London County Council Education Committee :—

Clarke & Bracey, 64, Coleman Street	£24,139
H. L. Holloway, Deptford	22,607
Thomas & Edge, Woolwich	22,195
C. Wall, Ltd., Chelsea	21,730
Killby & Gayford, 87, Worship Street	21,723
Holloway Brothers (London), Ltd., Lambeth	21,638
J. Smith & Sons, Ltd., South Norwood	21,378
F. & H. F. Higgs, Herne Hill	21,330
Lathey Brothers, Battersea Park	21,310
Stimpson & Co., Battersea	21,260
J. Greenwood, Ltd., London Bridge	21,253
E. Lawrance & Sons, City Road	21,138
W. Downs, Walworth Road	20,960
J. & C. Bowyer, Upper Norwood	20,883
Patman & Fotheringham, Ltd., Islington	20,733
W. Johnson & Co., Wandsworth Common	20,512
Kirk & Randall, Woolwich	20,475
Holliday & Greenwood, Ltd., Brixton	20,449
J. Marsland & Sons, Walworth	£20,248
J. Appleby & Son, Lambeth	20,120
J. Garrett & Son, 17, Balham Hill	19,971
J. & M. Patrick, Wandsworth	19,719
Treasure & Son, Upper Holloway	19,438

Maesycwmmer.—For the erection of chapel and schoolroom, for the Trustees of the English Baptist Church. Mr. R. L. Roberts, M.S.A., architect, Abercarn. Quantities supplied :—

T. Lewis, Bristol	£2,669	0	0
W. C. Jones, Merthyr Tydvil	2,570	0	0
Spratt, Tonypandy	2,520	0	0
Hamilton & Millard, Caerphilly	2,405	0	0
Jones Brothers, Quakers Yard	2,347	10	0
H. Rees, Blackwood	2,295	0	0
J. Lewis, Caerphilly	2,289	0	0
J. J. Partridge, Newport	2,280	0	0
J. Lloyd, Ystrad Mynach	3,245	0	0
J. Jenkins, Newport	2,230	0	0
E. Williams, Newbridge	2,195	0	0
J. Morgan, Blaenavon	2,170	0	0
M. Harding, Caerphilly	2,155	14	0
Vodden & Lee, Gilfach Pengam	2,122	7	3
J. H. James, Cardiff	2,120	0	0
W. Phillips, Ynysddu	2,110	6	0
W. Yeo,* Fleur-de-lis	2,011	15	11

* Accepted.

Newark.—For the erection and completion of additions to Coddington Manor, for Mr. H. Thorpe. Mr. Fairfax B. Wade, architect, Sloane Street, London, S.W. :—

G. H. Barker & Son, Hitchin	£3,249
C. Baines, Newark	2,618
Collins & Godfrey, Tewkesbury	2,586
G. Brown & Son, Newark	2,335
W. Smith, Newark	2,298

Redbourn (Herts).—For the erection of new stables with coachman's residence, for Mr. F. E. Hall. Mr. Henry F. Mence, architect, Town Hall Chambers, St. Albans :—

H. Salisbury & Son, Harpenden	£772
C. Miskin & Sons, St. Albans	700
Boff Brothers,* Park Street, near St. Albans	665

* Accepted.

Redbourn (Herts).—For alterations to "Cumberland Cottage," Crown Street, for Mr. F. E. Hall. Mr. Henry F. Mence, architect, Town Hall Chambers, St. Albans :—

Vail & Williamson, St. Albans	£549
C. Miskin & Sons, St. Albans	£535
H. Salisbury & Son,* Harpenden	449

* Accepted.

Redhill.—For the erection of children's homes at Meadvale, for the Guardians of Reigate Union. Mr. E. Penfold, architect, High Street, Reigate. Quantities by Messrs. John Leaning & Sons :—

A. B. Apted	£3,444	0	0
G. Cummins & Sons	3,342	0	0
J. Waycott	3,163	12	0
C. Parsons	3,010	0	0
J. Childs	3,000	0	0
W. Wickman	2,923	16	0
T. Nightingale	2,973	0	0
S. Jeal	2,945	0	0
G. Martin	2,784	0	0
J. Hodge & Son	2,632	0	0
G. Elsey & Sons	2,625	0	0

Reigate.—For entrance lodge, vagrant wards, receiving wards, workshops, mortuary and alterations to existing buildings at the workhouse, for the Guardians. Mr. E. Penfold, architect, High Street, Reigate. Quantities by Messrs. John Leaning & Sons :—

R. Dean & Co.	£17,580
H. Lovatt, Ltd.	16,937
Cropley Brothers	16,483
J. Smith & Sons	16,420
T. Bushby & Sons	16,057
G. Martin	15,946
F. G. Minter	15,649
Turtle & Appleton	15,286
H. Lindfield & Son	15,257
Potter Brothers	15,080
Kingerlee & Son	15,052
Grace & Marsh	15,006
F. Gough & Co.	14,958
Holliday & Greenwood	14,919
J. Longley & Co.	14,919
W. Wallis	14,727
Goddard & Sons	14,418
Akers & Co.	14,324
W. Smith & Sons	13,925
R. B. Amos	13,820
Martin, Wells & Co.	13,775
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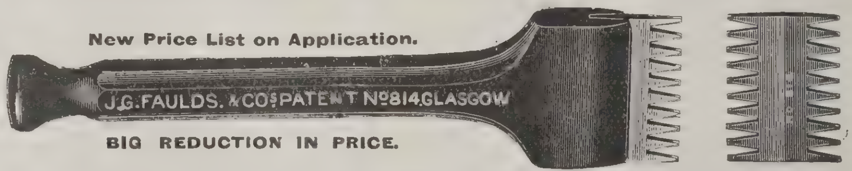

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* Accepted. [All of St. Albans.]

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E. Dunham	275
Boff Brothers, Park Street	272
Bracey & Clarke, Watford	250

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South Nutfield (Redhill).—For rebuilding the Station Hotel, for Messrs. Mellersh & Neale, Ltd. Mr. E. Penfold, architect, High Street, Reigate:—

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T. Bashford	1,649
W. F. Wilkinson	1,580
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Electrical Notes.

Explosions in Street Boxes.—Replying to a question in the House of Commons last week, Mr. Akers Douglas said that during the three years ended December 31st, 1904, the Metropolitan Police reported six explosions as having been caused by gas escaping into a telegraph inspection chamber and coming into contact with a leakage in an electric wire, and a seventh case in which a similar explosion of gas in a telegraph inspection chamber was supposed to have been caused by a lighted match. In addition to these seven cases, the police reported twenty-three similar accidents in which explosions occurred through the accumulation of gas in electric light or supply boxes.

Electric-driving in Cotton Mills.—Important experiments are taking place in Lancashire in regard to electric-driving in cotton mills. A new weaving shed which has been built for the Hesandford Manufacturing Co. at Burnley is the first cotton mill in this or any other country driven wholly by electricity. The power scheme was prepared by Mr. J. M. Hewitt, of Manchester; and though the mill has been running only a few weeks, highly successful results are being obtained. Despite the fact that the whole scheme is not yet completed, it is understood that, compared with other mills of the same size not driven by electricity, this pioneer effort is showing a saving of 10 per cent. in fuel. The engine which drives the mill is a vertical triple-expansion one of 1,000-h.p., and it is claimed to be the most efficient and economical reciprocating engine ever built, approximating as it does to the ideal of 1 lb. of coal per indicated horse-power. The three-phase motor system is employed, wits a pilot engine working a smaller continuous-current dynamo for lighting and other purposes after the main engine has been stopped, the three-phase dynamo, however, providing both for light and power when running. On small platforms ranged around the weaving-shed are twenty-three motors of 25-h.p. each, serving the looms, and the remaining motors are employed in the preparatory department. At Pendlebury, too, a new mill is being erected which is to be electrically equipped. If the ultimate results at these two mills are what the experts expect them to be, enormous possibilities will be opened up.

London Electricity Supply.—The battle of the electricity supply companies was begun in Westminster Hall on Friday before a House of Lords Committee. Forty counsel are engaged in the fight, and nine companies are struggling for the right to supply electrical energy either to the whole or to part of London. The companies are opposed by the L.C.C., borough councils and existing companies. The first and largest of the schemes is the Bill for the creation of the Administrative County of London and District Electric Power Co., with a capital of £5,000,000.

Electric Tramways in the Midlands.—The electric tramways of Northampton, Leicester, Gloucester and Derby are practically finished. About £400,000 has been spent during the past two years. The overhead trolley system is the favourite in the Midlands, although very good accounts are given of the surface-contact system of Wolverhampton. Aston Manor, Lincoln, Handsworth (Staffs.) and Stoke-on-Trent are busy with new traction systems or extensions.

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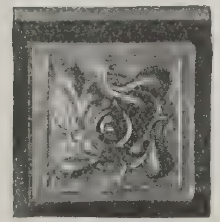

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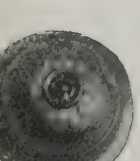

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For "Too Late for Classification" see page xvii.

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THE
BUILDERS' JOURNAL
AND ARCHITECTURAL RECORD.

March 29, 1905. Vol. 21, No. 529. 6, Great New Street, Fetter Lane, E.C.

Summary.

The appeal in the case of *Gibbon* v. *Pease* has been dismissed by the Court of Appeal, thus re-affirming that plans and specifications belong to the client, not to the architect. (This page and p. 168.)

The palace outlined in Bacon's essay "On Building" is the subject chosen for the Soane Medallion next year, an open-air swimming bath for the Tite Prize, and a stone skew bridge for the Grissell Gold Medal. (Page 165.)

The competitions for new schools at Swindon and a new technical institute at Rochester are unsatisfactory. (Page 165).

Mr. Alan E. Munby, M.A., F.C.S., suggests the formation of an information bureau for the building trades, which would collect, correlate and systematize facts, bring together a collection of manufacturers' samples, with reports thereon, and gather statistics from relevant work of societies, testing institutions and private experts. The bureau would be primarily in the hands of architects, contractors and those engaged in the sale of building goods (but not manufacturers). (Page 164.)

Mr. Needham Wilson read a paper on sketch plans and working drawings before the Architectural Association last Friday, in the course of which he referred to the great advance which had been made in water-colour work. It used to be a complaint that the drawings on the walls at the Royal Academy were the work of specialists employed to give fictitious merit to the designs. The fictitious merit might still be there, but at least it was now most usually the work of the designers themselves. (Page 169.)

The architectural exhibits at the Royal Institute of Fine Arts, Glasgow, are of very good average merit, but there is nothing outstanding. Some excellent photographs are shown. (Page 161.)

Resolutions in favour of architects' registration have been passed by the Leicester and Leicestershire Society of Architects and the York Architectural Society. (Pages 161 and 165.)

It may be considered safe to assume that a distributed live load of 40 lbs. per. sq. ft. will be sufficient to provide for a crowd of people as well as for the ordinary loads carried on floors used for offices or similar purposes, but for places where strong vibrations may be expected, such as ballrooms, drill-rooms, gymnasia, &c., 100 per cent. should be added to the uniform live load for impact and vibration, and the depth of the beams and girders should be limited to $\frac{1}{15}$ of their span. (Page 166.)

The central span of the new Vauxhall Bridge was set in position last week. (Page 165.)

A new theory about masonry dams is put forward. It is affirmed that vertical sections are liable to crack, though the horizontal sections may be sound. (Page 165.)

Ownership of Drawings. As will be seen by the report on p. 168 of this issue, the Court of Appeal has, unfortunately, upheld the decision of the lower court in the case of *Gibbon* v. *Pease* and confirmed in more unmistakable terms the legal view that architects' drawings are the property of the client. It is most important that the matter should not be allowed to rest here, but the case carried still further, and, if the House of Lords decides similarly, to promote legislation to give the architect his just rights. The case should be decided on equity, not on law. Our judges seem to think that an architect is paid for his plans. He never is, for they embody hard-earned knowledge and experience which the small percentage in no way equates. If an architect had a copyright in his designs the matter would be different. The fallacy that plans are the be-all and end-all of architectural design would be apparent if lawyers could only see that a building could be constructed from an architect's instructions without them. An architect is paid for advice, invention and supervision, not to prepare drawings *per se*.

Planning of Suburbs. The housing problem has been talked about so much and so often that it is now seldom any new light is thrown on the subject, but the resolution passed at the conference held at the Passmore Edwards Settlement last Saturday under the auspices of the National Housing Reform Council to consider the question of "the better planning of new housing areas in Greater London" supports what we have often advocated, and should lead to some reform of the present system. It is as follows: "That this conference desires to draw the attention of local authorities in the suburban area of Greater London to the grave evils resulting from the lack of proper foresight in the planning of new housing areas, and to the pressing need for the preparation and adoption of new by-laws, to ensure the ample provision of light and air-space, gardens, &c., for workmen's cottages; further, this conference is of opinion that Parliament should confer on local authorites various new municipal powers in regard to the preparation of building plans, the taxation of land values, and the purchase of municipal estates, similar to those powers already possessed by cities in the German Empire." Mr. T. C. Horsfall, of Manchester, who moved the resolution, emphasized the need for the granting of powers to the county councils in this country to make their own building plans, and also for local authorities to buy land in the open market without going to Parliament for powers to do so.

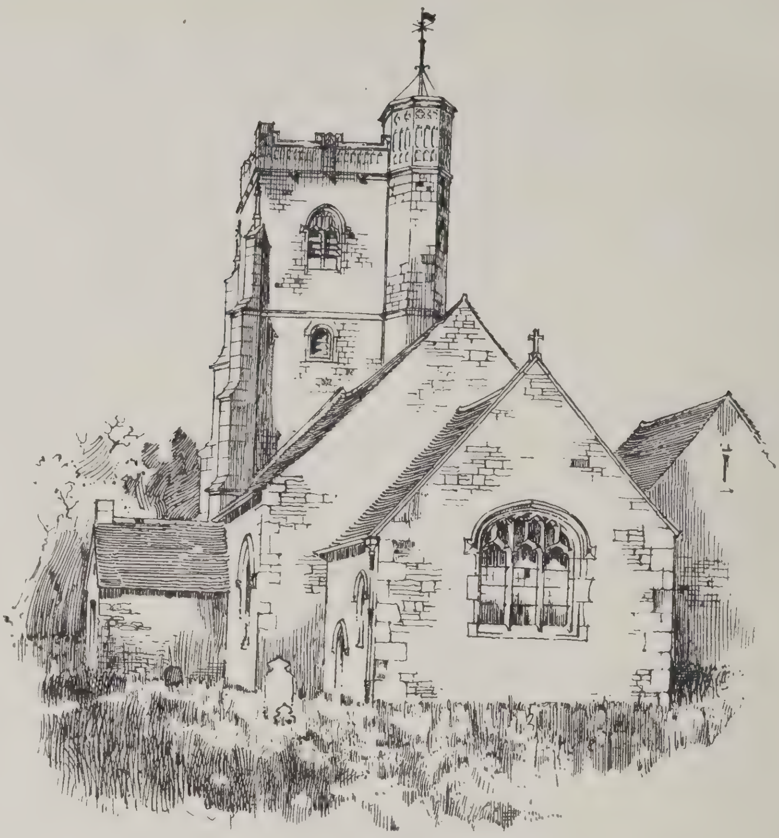
The Stuffy House. The ventilation of the House of Commons may be regarded as a perennial subject for an official report, and it is therefore with no surprise that we find another such report before us now: in fact, it may be said that the history of ventilation begins with the attempts at ventilating the Houses of Parliament in 1660 by the architect, Sir Christopher Wren, and that as almost every device has been tried in its halls at one time or other the history of the attempts is almost equivalent to a history of the science of ventilation. The several recommendations in the present report are doubtless of interest to members and to the staff responsible for preserving an equable atmosphere in the Chamber, but it is no moment to the outside world that not even the policeman shall walk over the inlet grating, that the steam pipe in the cotton-wool filter under the Speaker's chair should be covered with asbestos, or that the ventilating men should be clad in white overalls and wear felt slippers. There are many facts in this report, however, which are of the greatest general interest to all concerned with ventilation; and these we may briefly summarize. It may first be stated that the report is presented by Dr. M. H. Gordon, M.A., B.Sc., assisted by Mr. W. H. Hurtley, D.Sc., demonstrator of public health chemistry at St. Bartholomew's Hospital, and Dr. John Aitken, F.R.S., who was the first to demonstrate that fog was due to the condensation of moisture on dust particles in the air and the first to invent a method of counting them. The investigation was carried out between May and August last year, when the House was sitting. The most interesting statements in the report are undoubtedly those relating to the temperature and humidity of the air. So far as the former is concerned it is satisfactory, being, on an average, 63 degs. Fahr. in the equalising chamber; but as regards humidity it is found to have only 63 per cent. of saturation as compared with 70 to 80 per cent. as recommended by de Chaumont and 73 to 75 per cent. by Wilson; moreover, the percentage of humidity of fresh air at the inlet was 71 per cent., and the vapour required to saturate a cubic foot of fresh air was 1·6 grains at the inlet and 2·4 in the House. Thus, it seems to be clear that the stuffiness and deadness which causes members to sink wearily on their benches is very largely attributable to this want of humidity. In other respects the air is comparatively satisfactory, though it is somewhat polluted by the bacteria brought in on members' boots and by the insanitary condition which the hair matting on the floor gets into.

ST. BRIDE'S, WENTLOOG.

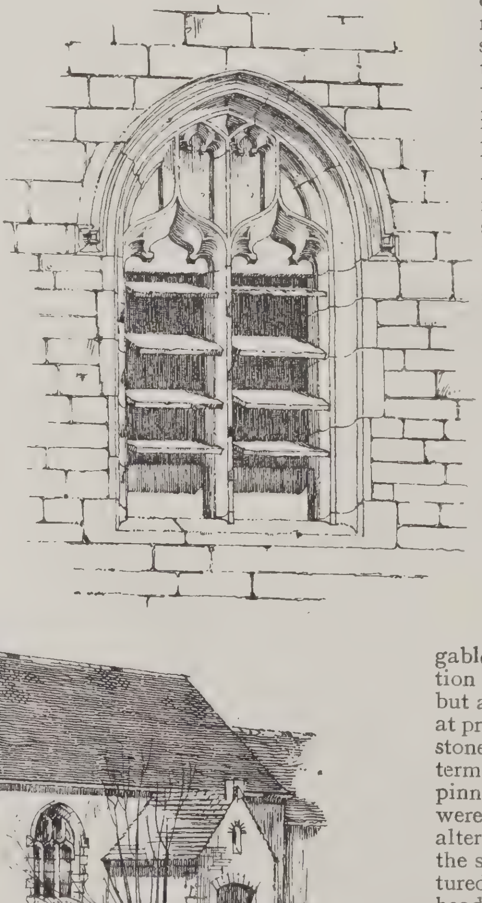
By H. T. REES.

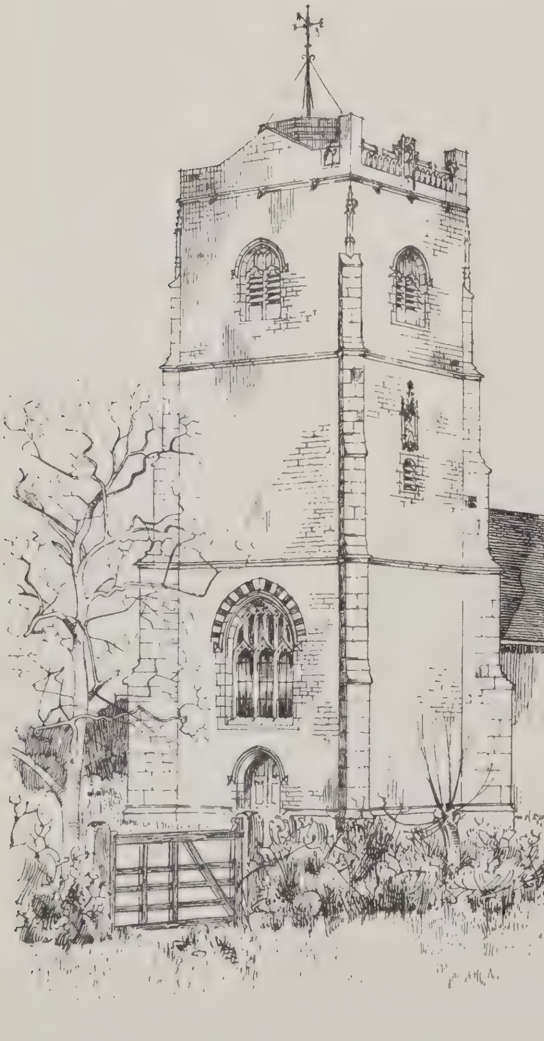
IN the south of Monmouthshire, with the Bristol Channel on one side and shut in by a range of hills on the other, stretches a broad flat expanse of fertile country known as the Wentloog Level. In every direction it is intersected by reens and dykes, which, lined with pollard willows and crossed at intervals by small bridges of brick or stone, weather-worn and lichen-covered in numerous instances, form picturesque subjects for the artist: and over it, in a sinuous line, stretches the old coach road. Until comparatively recent times large slices of this country were periodically washed away by the sea, which, continually undermining the base, caused subsidences and threatened to make an appreciable difference in the area of the land, until the farmers of a couple of generations ago proceeded to erect sea defences taking the form of training walls, the extent of each man's work being recorded on tablets built into the wall, stating the number of perches undertaken and the date of erection.

The district is rich in churches, some of considerable architectural merit and all having features of interest well worth the consideration of the student.



The example selected for illustration in this article is dedicated to St. Bride, and gives its name to the neighbouring hamlet. It has been chosen on account of the excellence of its tower, which, with the main body of the church, is of the Perpendicular period. The plan is of a type peculiar to this part of the country, in that it has an aisle on one side of the nave—in this instance on the north side—and extending for two bays only; the arcading has, however, been filled in with brickwork during the last century, thus shutting the aisle off from the nave and converting it into a separate compartment. The church is built of lias-lime stone rubble, which is still obtained in this and the neighbouring counties, and the visitor is told of the string of strong men passing the stones from hand to hand from the quarry in the vicinity to the site of the church. The buttresses, windows, &c., and the parapet and turret of the tower, are of a limestone similar to Bath stone, which is exceedingly well preserved. The quality of the workmanship in the tower is far superior to that in the rest of the structure, the walling being of squared regular-coursed rubble and the tracery and mouldings of much better design. At the north-east corner is an octagonal stair turret, the upper part ornamented with cusped panelling (see next page). The parapet on the south and east sides is also panelled, and there is evidence of this having been continued around the tower. In the centre of the panelling are niches, which probably occurred on each side, but those on the west and north sides have disappeared, plain walling having been substituted for the panelling. On the west side is a small gable of low pitch, which suggests an intention of covering the tower with a ridged roof, but all traces of this have disappeared, that at present existing being a pyramidal one of stone tiles. In all probability the square terminations at the corners were the bases of pinnacles, but these have either fallen or were removed at the same time as the alterations were made to the parapet. On the south side of the tower, in a small sculptured niche, is a figure of the Virgin, but the head has been removed, as have also those from the figures in the niches of the parapet—a reminder of the Commonwealth. The west window, although smaller than many others in the district, is a fine specimen of the style, and is rendered more effective by having voussoirs of red sandstone alternating with the grey limestone in the arch surmounting the label. The chancel is of a later period, and debased in style, having a low four-centre arched east window with a





heavy hood-mould. It has, however, a very quaint appearance with its weather-stained walls and stone-tiled roof. Over the door of the porch is a stone sundial, and inside, on the right of the inner door, is a mark 4ft. 6ins. above the floor, showing the height of the flood which covered all the surrounding country in the great inundation of 1607.

The tower is out of the perpendicular to an extent of at least 3ft., leaning to the north-west, probably through insufficient foundations for the yielding nature of the ground. In my opinion it must have settled during the course of erection, as there is evidence of attempts having been made to correct the want of verticality, at least three lines of direction being observed at the junction of the north-west buttress with the walls of the tower, in addition to the square blocks in the parapet, and other features, being kept upright. Despite this defect, it stands firm enough to-day, and forms a landmark for miles around, having weathered to a fine clean grey colour.

[Serious damage to the tower of Peterstone Church, Wentloog, has been caused by recent storms, and an appeal for its repair is now being made. The body of the church, which is Norman in style, was restored some years ago, but the tower was left untouched.]

THE ROYAL INSTITUTE OF FINE ARTS, GLASGOW.

Architectural Exhibits.

THE forty-fourth annual exhibition of painting, sculpture and architecture of the Royal Institute of Fine Arts is now being held in the Institute's new galleries in Sauchiehall Street, Glasgow. The show this year is a good one. Many very fine pictures hang on the walls, while some of the sculpture pieces exhibited are of more than average interest.

The architectural drawings and photographs this year are shown in one of the long galleries together with some of the black-and-white and other minor works. This is a distinct improvement on the arrangement of former years, which tended to crowd the architectural works into a dismal little room by themselves, and even thrust them out on to the stair landing.

But while this year the works are better hung and of very good average merit, there are no outstanding exhibits which compel attention. Probably the best drawing shown is the coloured study of St. Mary's Church, Oxford, by Mr. James B. Fulton, but in pure line work Mr. Alexander McGibbon shows to good advantage in many perspectives.

Taking the exhibits in the catalogued order, the first is the new theatre at Kilmarnock by Mr. Alex. Cullen, F.R.I.B.A. This is a somewhat unsatisfactory front, and cannot be compared with the other exhibit by the same architect—the new municipal buildings and public library at Hamilton. This latter is a good piece of Renaissance design, well-drawn, and accompanied by a plan.

Next Mr. D. W. Sturrock shows a clean drawing of an Arran house, and Mr Fred Rowntree a picturesque lodge at Torquay. M. A. N. Paterson is represented by a series of nine photographs of a small country house, with carefully-wrought detail. The same architect also exhibits a large pencil drawing (touched up in the foreground with coloured chalks) of the Kyles of Bute Hydropathic, a design in the Scottish baronial style.

Messrs. H. & D. Barclay show the large warehouse in Queen Street for which they are responsible and a competitive design for a church. Neither of these, however, is satisfactory. The same criticism applies to Messrs. Honeyman, Keppie & Macintosh's block for Messrs. Annan, the well-known photographers, and an Ayrshire library. Six photographs illustrate the former.

Two photographs are exhibited of the music-room and stair of SS. Jongaia by Mr. J. M. Crawford, I.A. The detail is a trifle fanciful. Mr. James Lindsay is represented by the Baptist Church at Springburn and a district library and municipal offices: the drawing, however, is hard. Messrs. Miller & Black show Kennyhill House, while Messrs. Watson & Salmond exhibit a very picturesque drawing of a gate lodge for Tulliallan Castle. The same architects also sign a sketch for a library at Montrose.

Messrs. Peddie & Washington Browne have sent a large elevation of the North British and Mercantile Insurance Co's. new head-office in Edinburgh, a scholarly design on safe lines.

The competitive design for the Glasgow Technical College by Messrs. Thomson & Sandilands is shown, and, as far as elevation at least is concerned, is superior to what is being erected.

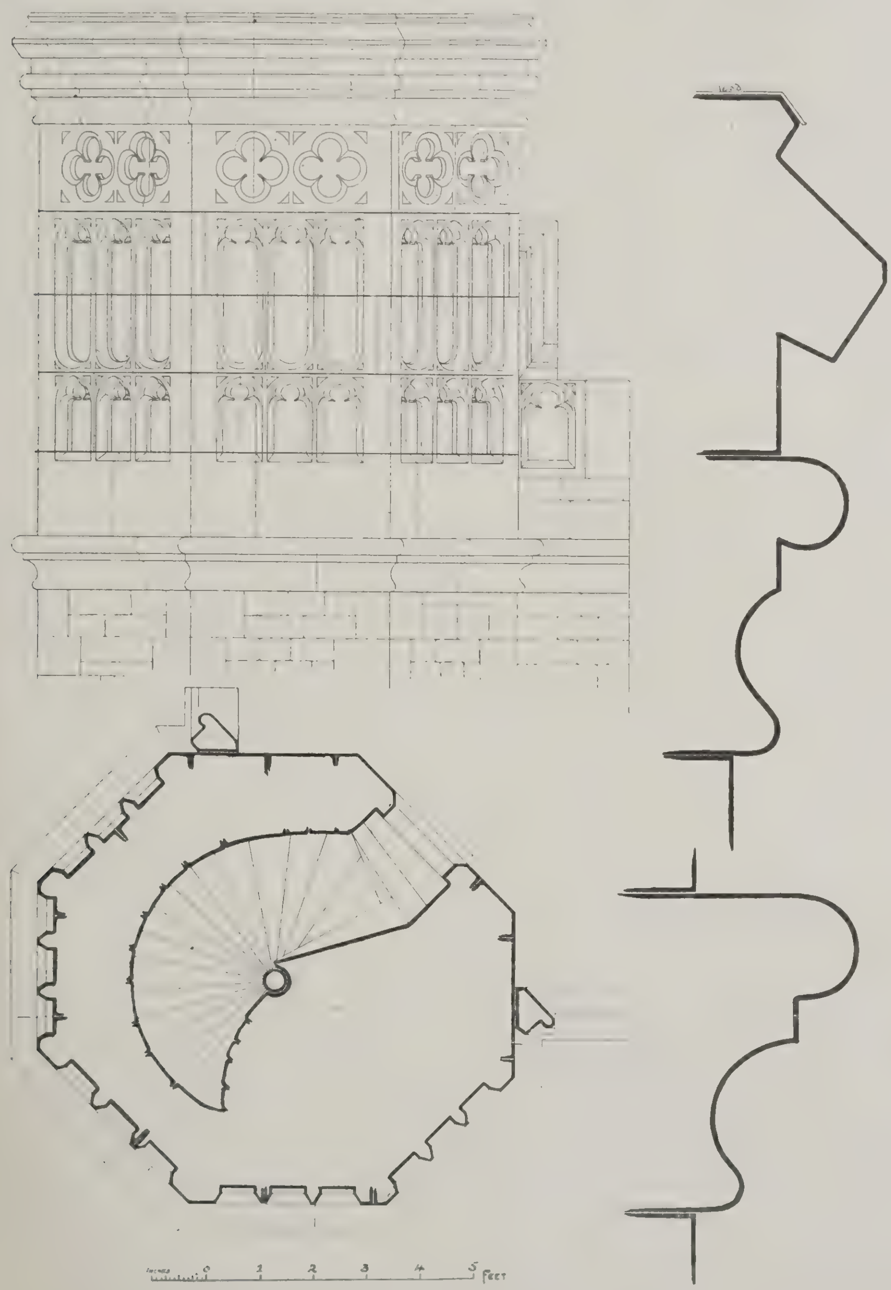
Messrs. Walker and Ramsay exhibit elevations of town hall and council-chambers, Kirkintilloch, Messrs. Beattie & Morton photographs of Nordheim, Bearsden, and Messrs. Salmon, Son & Gillespie the nurses' home at Woodilee, Lenzie, already illustrated in these columns.

In the Hill House, Helensburgh, the "Macintoshy" style is decidedly overdone. Messrs. Leadbetter and Fairley show Dalveah, Loch Ard, which was illustrated some months ago in THE ARCHITECTURAL REVIEW, as also the work of Mr. R. S. Lorimer at Craigmyle, Aberdeenshire. The work is in the usual scholarly style which we associate with this architect. The gatehouse is also illustrated.

An unusually large number of photographs of work are shown this year, among the best of these being Mr. E. A. Sutherland's premises, Paisley, Mr. A. Balfour's Normanhurst, Bearsden, and Mr. John Nisbet's architectural interiors and doors, the last two fantastically shaped.

In addition, there are a number of drawings that are so "skied" as to be practically beyond criticism.

Leicester and Leicestershire Society of Architects.—At the general meeting held on March 15th to discuss the subject of the statutory qualification and registration of architects the Society's resolution of June 3rd, 1904, was re-affirmed, and the opinion was expressed "that it is the duty of the Council of the Royal Institute of British Architects, as representing the profession, to make serious and immediate effort to obtain Parliamentary powers for the purpose of establishing statutory qualification of architects."



ST. BRIDE'S CHURCH, WENTLOOG, MONMOUTHSHIRE: TURRET ON TOWER.
MEASURED AND DRAWN BY H. T. REES.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Bevels for Hip Tiles.

Prof. Henry Adams writes to point out a slight mistake in his reply to the enquiry about bevels for hip tiles on p. 136 of our issue for March 15th. Instead of drawing K L perpendicular to D E, J L should be made equal to J K.

Cemetery Chapels.

PERTH.—GOTH writes: "What are the requirements of a cemetery chapel for Episcopalian worship? Is an altar necessary? Where is the bier placed? Is a lectern used during the service?"

An altar should be provided, raised three steps above the general level of the floor and allowing a width of 3ft. in front thereof and 18ins. for the two treads. The coffin is placed on a bier in the middle alley with the feet towards the altar, and should be surrounded with candles, four on each side, in large candlesticks standing on the floor. Ample passage space must be left all round. A lectern is a great convenience from which to read the lessons.

CHARLES SPOONER.

Cost of Central Hall in Elementary School.

WATERFOOT.—BETHEL writes: "The Board of Education give the limit of cost for elementary schools as £10 per scholar, but state that an additional allowance will be made for the cost of a central hall not calculated in the accommodation. Can you give me any idea as to the amount of this extra allowance?"

In the old days the Board of Education permitted a class to be taught in the central hall. Therefore they advanced the limit per scholar for that class. They may do so still, but this is a matter which must be decided by the Board only, and you must state your case to them. In the conditions of recent competitions the sum of £10 per scholar is invariably made to cover the cost of the central hall.

T.

Wind-pressure on Roofs and Walls.

LONDON.—SURVEYOR writes: "In calculating the thickness of wall for a building 6oft. long by 30ft. wide, with a roof of glass and galvanized iron supported on eight steel roof-trusses, the direction of the reaction of the fixed end of each truss was found to be 58° 53″ with the horizontal and acting with an intensity of 3,776 lbs.; the walls supporting roof are 9ft. high. The wind-pressure on roof acting normal to its surface ($p \sin. \theta$) and on wall is taken at 40ft. per ft. super., and equating the overturning moment with the moment of stability the wall should be at least 2ft. 3½ins. thick. The Building Act requires a 14in. wall, and from experience I should think that this would be enough. Is 2ft. 3½ins. the thickness of the two walls? The calculated thickness of wall is to withstand a pressure of wind acting with an even pressure of 40 lbs. over each square foot of the resistance area. It seems to me that this might be so in a very exposed position. Is it probable that such a pressure would be reached in a town except in the case of high buildings, such as towers?"

The pressure of the wind is taken by various authorities at 56, 40 or 42, and 28 lbs. per sq. ft. against a plane surface perpendicular to its direction. The former could be reached only in a very exposed position, and the latter is usually sufficient for all cases in a town. By the writer's empirical formula based upon a full consideration of the whole question $\log. p = 1{\cdot}125 + 0{\cdot}32 \log. g - 0{\cdot}12 \log. l$, where p = ultimate wind-pressure in lbs. per sq. ft. necessary to be allowed for against a plane surface perpendicular to the direction of the wind, g = height of centre of gravity of surface considered—above ground-level in feet, l = length in feet of part to be taken as one surface. Assuming the roof in question to be 30ft. span, rise ¼ span and trusses 7ft. 6ins. apart, the horizontal pressure to be resisted by each truss would be $\log. p = 1{\cdot}125 + 0{\cdot}32 \log. \left(\frac{7{\cdot}5}{2} + 9\right) - 0{\cdot}12 \log. 7{\cdot}5 = 1{\cdot}125 + 0{\cdot}32 \times 1{\cdot}10551 - 0{\cdot}12 \times 0{\cdot}87506 = 1{\cdot}125 + 0{\cdot}3537632 - 0{\cdot}1050072 = 1{\cdot}373756$, whence $p = 23{\cdot}64$ lbs. per sq. ft. horizontally. For the wall $\log. p = 1{\cdot}125 + 0{\cdot}32 \log. 4{\cdot}5 - 0{\cdot}12 \log. 7{\cdot}5 = 1{\cdot}125 + 0{\cdot}2090272 - 0{\cdot}1050072 = 1{\cdot}22902$, whence $p = 16{\cdot}94$ lbs. per sq. ft. Then the effect normal to the roof will be $p \sin. 26\frac{1}{2}^\circ = 23{\cdot}64 \times {\cdot}4462 = 10{\cdot}5482$ lbs. per sq. ft. The length of rafter under wind-pressure will be $\frac{30}{2} \sec. 26\frac{1}{2}^\circ = 15 \times 1{\cdot}1174 = 16{\cdot}76$ft.; and the centre distance of trusses being 7·5ft., the total pressure will be $16{\cdot}76 \times 7{\cdot}5 \times 10{\cdot}5482 = 1{,}326$ lbs. Assuming the trusses to weigh 675 lbs. each, and the covering to weigh 14 lbs. per ft. super., the total dead load on each truss will be $675 + 16{\cdot}76 \times 2 \times 7{\cdot}5 \times 14 = 4194{\cdot}6$ lbs. These results are shown by Fig. 1, and the reactions by funicular polygon are found to be 2,460 lbs. and 2,940 lbs. The wind-pressure against the wall will be $16{\cdot}94 \times 9 \times 7{\cdot}5 = 1143{\cdot}45$ lbs. and the weight of wall at 112 lbs. per cub. ft. $= 9 \times 7{\cdot}5 \times 1{\cdot}125 \times 112 = 8{,}505$ lbs. The resultant of pressure from roof and wind-pressure, as shown in Fig. 2, will be 3,250 lbs., and this compounded with the weight of the wall will be 11,580 lbs., which will cut the base at the edge. But it is fair to take the two walls as acting together, as in Fig. 3, when the final resultant is found to be 22,500 lbs. acting at 11ins. from the edge. Then $\frac{W}{A} + \frac{M}{Z} = \frac{22400}{2{\cdot}25 \times 7{\cdot}5} + \frac{22400\left(\frac{2{\cdot}25}{2} - \frac{11}{12}\right)}{\frac{1}{6} \times 7{\cdot}5 \times 2{\cdot}25^2}$, whence the maximum pressure will be 2064·8 lbs. per sq. ft. on the outer edge. In Figs. 2 and 3 the force scale is reduced as the values increase, so that the lines may not be an unwieldy length, and W in the formula above is the vertical component of the resultant.

HENRY ADAMS.

A Curious Claim for Rates.

ENQUIRERS write: "A client purchased a house which he entered on December 10th last year. About November 1st, the client having decided to carry out some alterations, we fitted up a room in the house as an office for the use of our resident draughtsman, so that he might make a survey of the house preparatory to making contract plans. In January contracts were accepted and the builders began operations, which are now in progress. Of course, our assistant did not live on the premises. Now, because of the above proceedings, the local tax collector has called upon our client to pay occupier's rates. We should like to have your opinion as to whether our action constitutes an occupation within the meaning of the statute under which such rates are levied, and if so whether we are liable for a full half year. The work is in an urban district in the north of England."

I assume that the house in question was empty (*i.e.*, unfurnished). In no case could your client be charged rates for a longer period than he actually occupied the premises; but in this case I am of opinion that

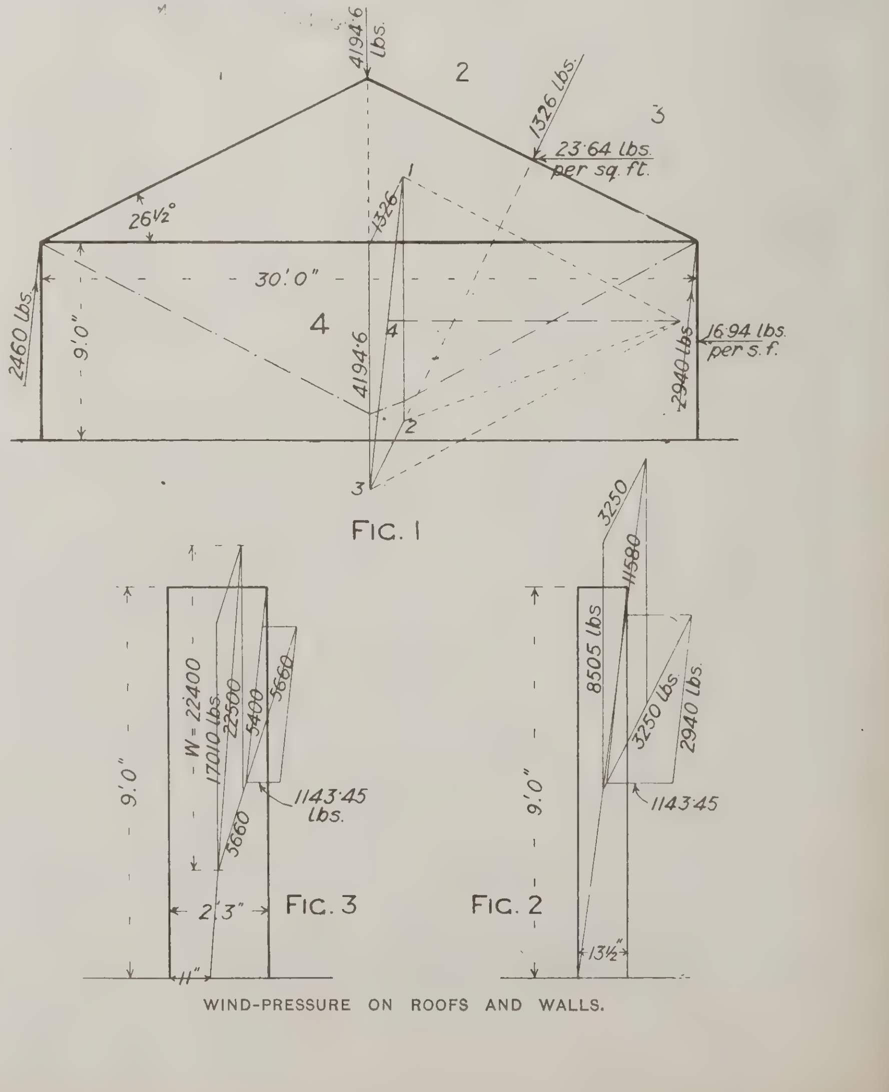


FIG. 1

FIG. 3

FIG. 2

WIND-PRESSURE ON ROOFS AND WALLS.

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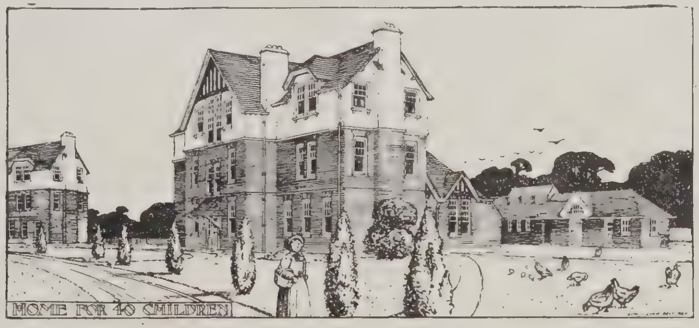
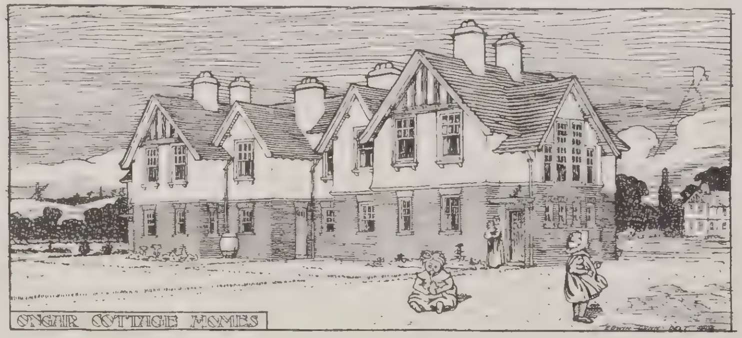
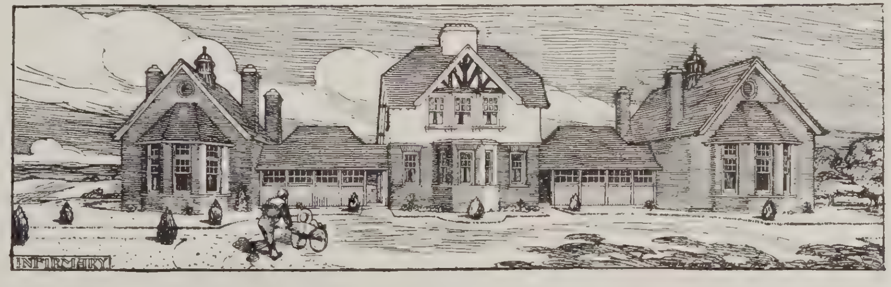
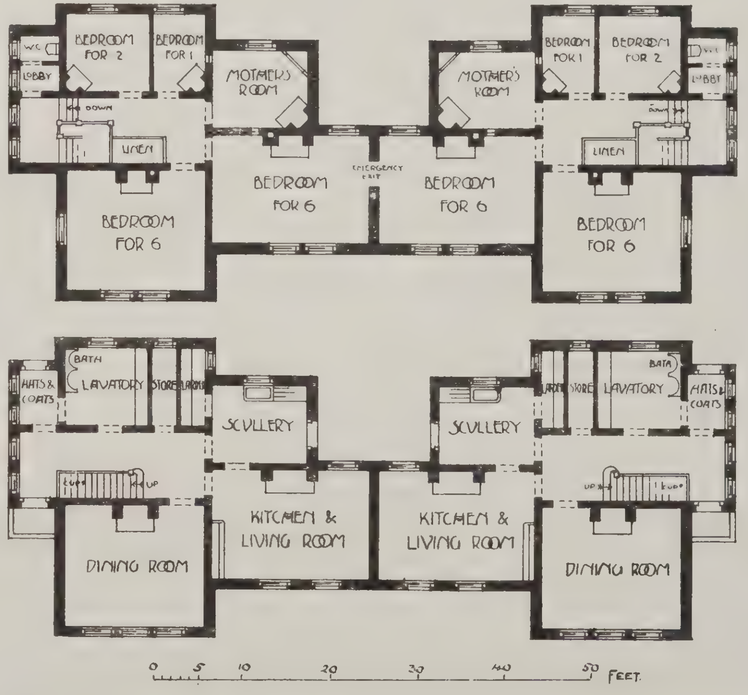
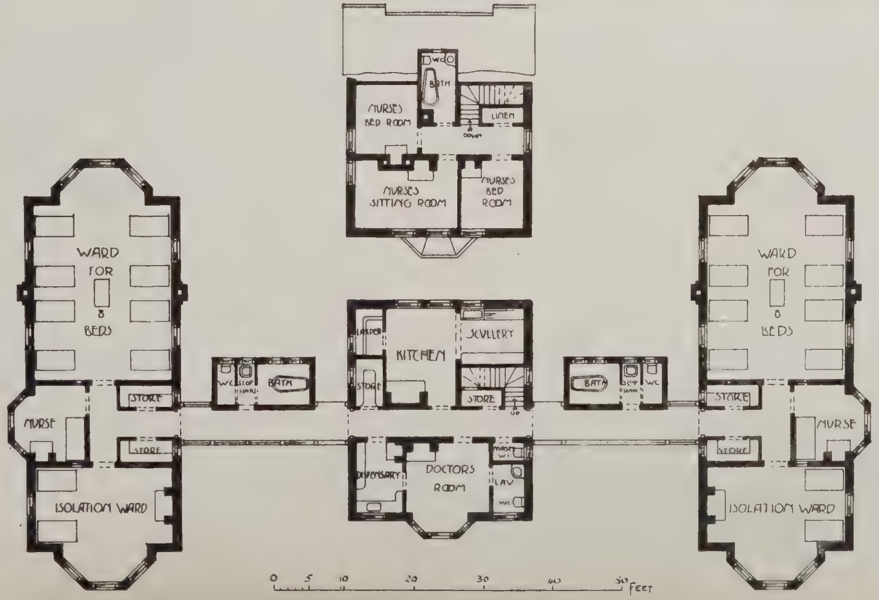
Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, March 29th, 1905.

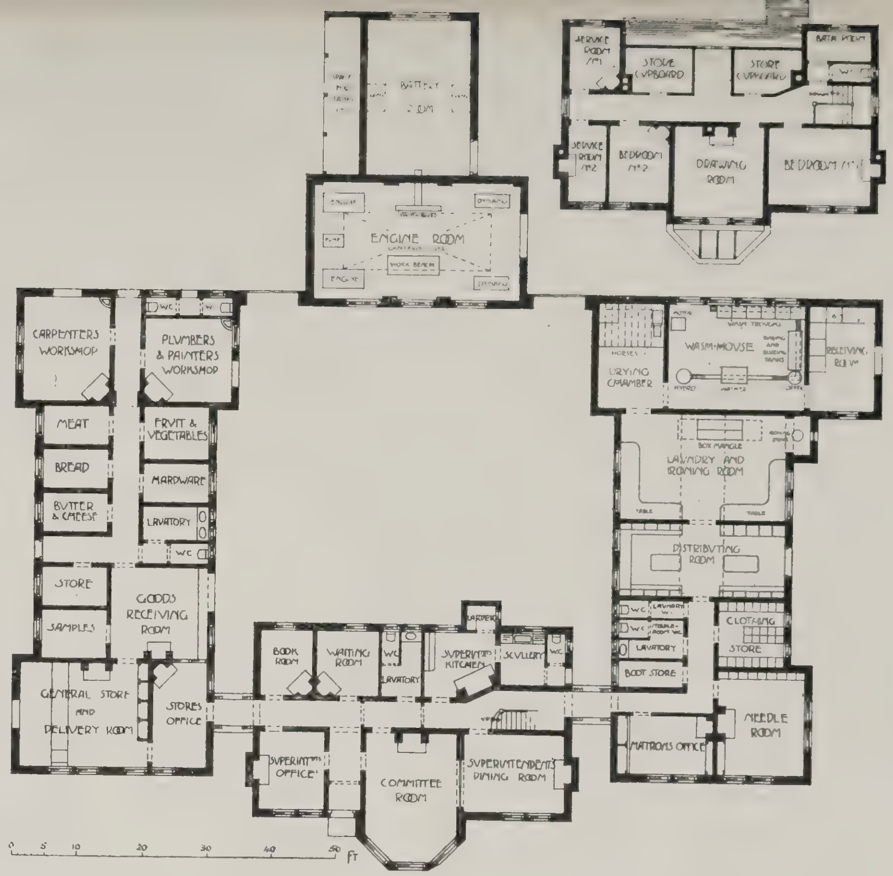

HOME FOR 40 CHILDREN

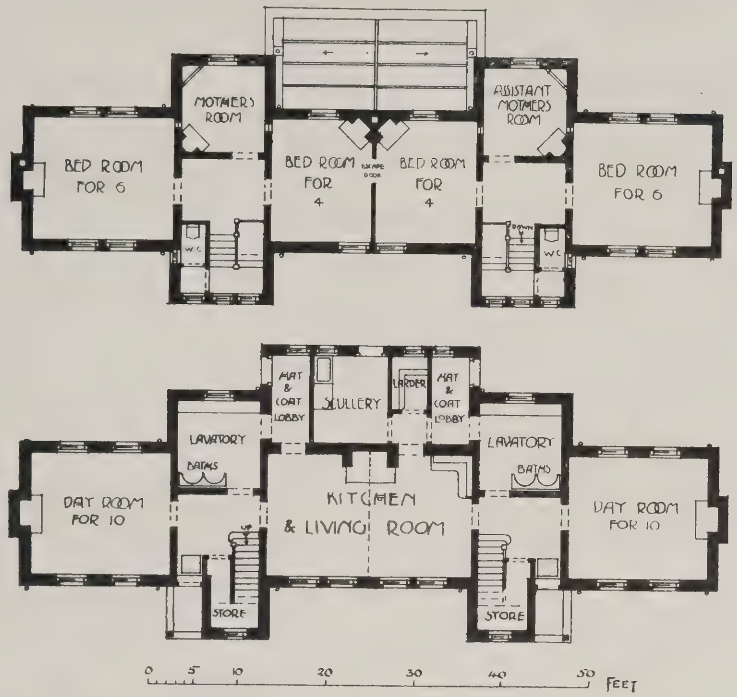

ONGAR COTTAGE HOMES

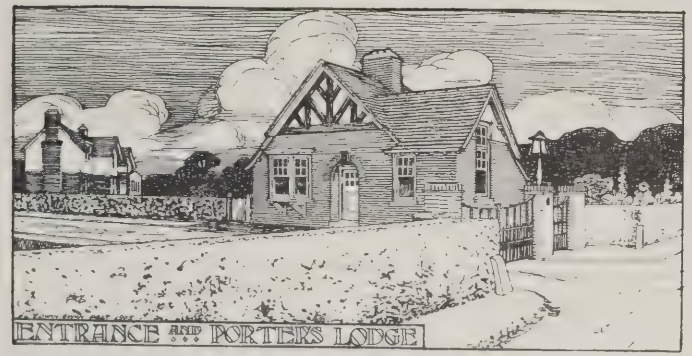

INFIRMARY











Cottage Homes at Chipping Ongar, Essex, for the Hackney Union. W. A. Finch, Architect.

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there was no such "exclusive and beneficial occupation" as would render the premises liable to be rated. Houses under construction are exempt from rating, and although there is of course an occupation of land during the building there is not the "beneficial occupation" which must take place before liability to rating is incurred.

F. S. I.

PAST TRADITION AND MODERN DESIGN.

IN the course of a paper on this subject which he read before last Thursday's meeting of the Leeds and Yorkshire Architectural Society Mr. Percy S. Worthington, of Manchester, said that although in our professional education we were certainly behind some other countries, the work now being done in this country was equal to, if not better than, the average work of any other country, France perhaps excepted. The student or apprentice of the fifteenth, sixteenth and seventeenth centuries was trained in the three arts of sculpture, painting and architecture, and in after-life practised all three. Buildings were books then as now, and their measurement formed the self-education of the architect, whether he did it as Peruzzi did with an eye to the composition of his architectural backgrounds, or as Brunelleschi with the definite idea of constructing his dome at Florence. With us in England it was different, but we could hardly afford to ignore their experience, and we might take it as an axiom that for the intelligent study and practice of design a knowledge of the history and architecture of past times was essential. Taste might be acquired to a degree by education and experiment without being inborn, and this was within the reach of all. As an example of trying experiments with antiquity, one might cite that fine and distinguished work, the new Westminster Cathedral. With regard to planning, certain types of plans were still more or less traditional, that, for instance, of places of public worship, though even here one saw no reason why some modern type might not be evolved which might appeal to religious instincts as much as old.—The following were elected officers of the Society for the ensuing session:—President, Mr. G. B. Bulmer; vice-presidents, Messrs. H. S. Chorley and R. A. Smithson; hon. secretary, Mr. R. P. Oglesby; hon. treasurer, Mr. W. H. Thorp; hon. librarian, Mr. G. F. Bowman; council, Messrs. R. Marshall, F. Musto, A. J. Hill, H. A. Chapman, P. Robinson and G. E. Reason.

THE RECTILINEAR PERIOD.

AT last Thursday's meeting of the Sheffield Society of Architects and Surveyors Mr. W. J. Hale, F.R.I.B.A., delivered a lecture on the "Rectilinear" period of Gothic architecture, extending from 1360 to 1547, that is, from the latter part of the reign of Edward III. to the close of the reign of Henry VIII. The skeleton forms on which rectilinear tracery was based were shown by diagrams, and it was argued that the introduction of a vertical line into the window head was a natural step, which tied the composition of the whole window together in a logical manner; and it was claimed that this method fulfilled Ruskin's aphorism, "Tracery must not be considered or imagined as flexible." With further diagrams the development of vaulting was traced from the rib to the true fan vault, and the method of construction and the principle of its stability were explained. It was also contended that although in fan vaulting the rib and the panel were not separate, the method was truly constructional, and that the sinking of panels in the stone, with the ribs emphasizing the lines of resistance, was a correct method of reducing the weight and ornamenting the surface. Attention was called to the influence of the chamfer plane on the form of the mouldings, common to the period, and allusion was made to the tapering outline which was produced by the repeated set-back of the buttresses, particularly those to towers, which gave a feeling of repose and stability.

OUR PLATE.

THE children's colony of the Hackney Guardians at the quiet little town of Chipping Ongar, in Essex, shows that, so far as creature comforts are concerned, the lot of the workhouse child is not devoid of its advantages. It is indeed a question whether, in the revulsion of feeling from the former severity with which boards of guardians were wont to regard their hapless wards, they have not allowed solicitude for their welfare to urge the pendulum unduly in the other direction.

The buildings provide for 300 children (the maximum number sanctioned by the Local Government Board for any one group of this kind), and have been so designed as to be capable of use by either boys or girls. The accommodation is provided in eight blocks—two pairs of cottages, each for fifteen children, and six houses for forty children.

In addition to these there is a probationary cottage for twenty children, common to the use of boys and girls, and an infirmary with a central block containing kitchens, dispensary, and nurses' quarters, separating wings, each comprising an eight-bed ward with duty-room adjoining, and isolation room for two beds.

The fact that the resources of the town would be somewhat severely taxed by so large an addition, amounting to nearly half its population, has caused the administrative block to assume somewhat important proportions, sufficient, in fact, to ensure almost complete independence. Here it has been necessary to provide extensive storage accommodation, pumping machinery to supply the various buildings with water, and electric plant for lighting and power worked by gas-engines.

The workshops provided are intended solely for repairing work, as it is not contemplated that any instruction will be given except in home duties, one of the fundamental ideas in such cottage homes being that the children receive an ordinary education with others of their class at outside schools. The machine laundry deals with the clothing from the larger houses, infirmary, receiving home, &c., a small detached hand laundry being provided in the rear of each of the cottage blocks for the use and instruction of the elder girls, for whom these cottages are intended. In the administrative block small bedrooms are provided for the girls who act as servants to the superintendent's house and receive finishing touches under the supervision of the matron before passing out to service.

It seems unfortunate, architecturally, that the Guardians—for administrative reasons presumably—should have fixed as the number to be housed in the larger blocks so many as forty. This is very prejudicial to the "cottage" character so far as these buildings—the major part of the scheme—are concerned. Even so, it is open to question whether a result more satisfactory could not have been attained without increase of cost or sacrifice of efficiency by a design comprising two storeys only.

The buildings have been erected by Messrs. McCormick & Sons, of Northampton Street, Essex Road, from the designs and under the superintendence of Mr. W. A. Finch, of 16, Finsbury Pavement, E C. The contract amounted to £45,987.

Views and Reviews.

Kidder's Pocket-book.

The first edition of this valuable American pocket-book for architects, structural engineers, builders and others was published nearly twenty years ago and contained but 586 pages. The present edition, the fourteenth, containing 1,656 pages, is a completely rewritten one and has taken three years in preparation. The author in his revision has kept the following points in view:—(1) A reference-book which should contain some information on every subject (except design) likely to come before an architect, structural engineer, draughtsman or master-builder, including data for estimating the approximate cost; (2) to as thoroughly cover the subject of architectural engineering as is practicable in a handbook; (3) to present all information in as simple and convenient a form for immediate application as is consistent with accuracy—to which end a great many new tables arranged and computed by the author have been inserted. In these objects it must be said Mr. F. E. Kidder has succeeded. The book is of course

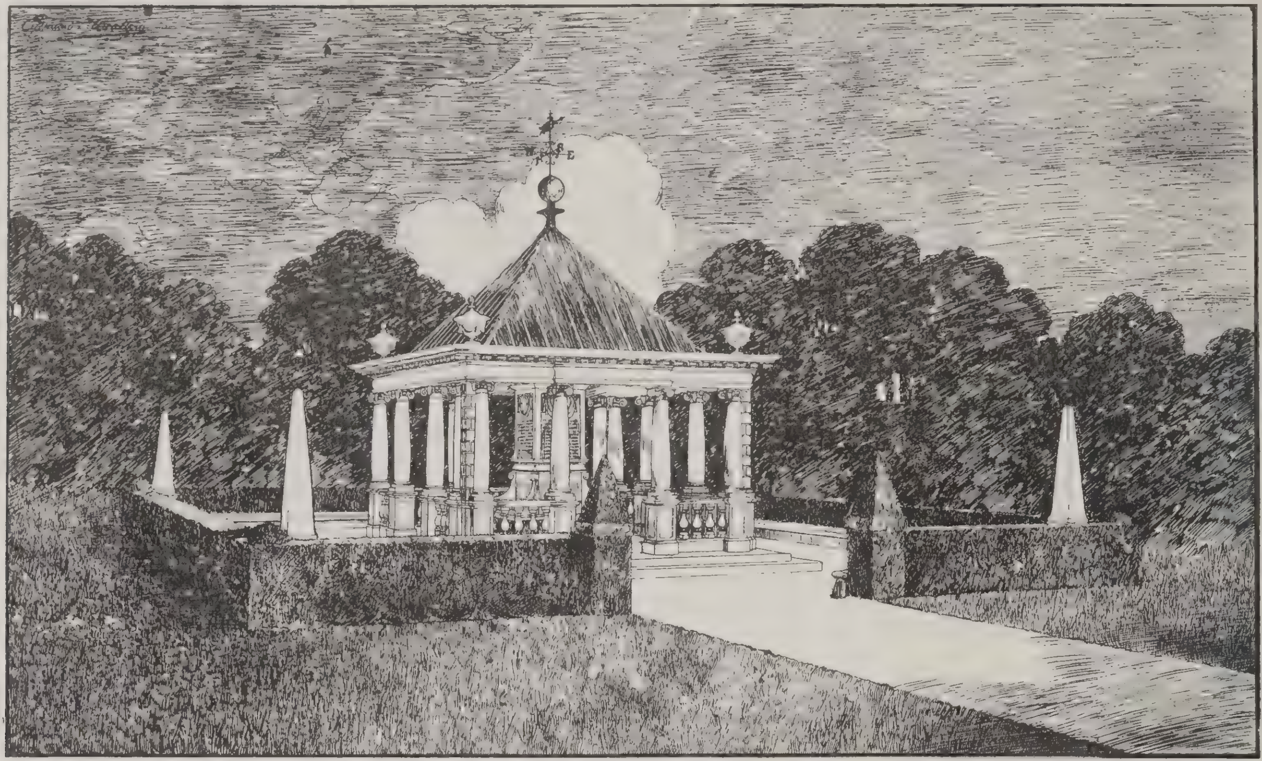
Too Large for the Pocket,

but few persons ever carry these small aid books in their pockets, the merit in them being their handy size, and in this respect no exception can be taken to Kidder's Pocket-book. The author has fulfilled his aim in giving architects and builders a handbook in its field as usual and reliable as Trautwine's has been to civil engineers. It is incomparably superior to the pocket-books and small handbooks published in this country, and should be in every architect's library; for though designed primarily for America, it contains much information of universal application. The book is particularly valuable to us in the direction of providing information on structural engineering, which is now so all-important in American building practice, because in this country we are rapidly developing in the same direction. In Mr. Kidder's words, "To-day structural and architectural engineers are concerned almost exclusively with building construction, and their work is more closely allied to that of the architect than to that of the civil engineer; hence the author has had in mind the needs of the structural engineer and draughtsman as well as those of the architect and builder, and the book should be of nearly equal value to both." In the book all the special features of

Skeleton Construction

which we have shown our readers in our articles on the Ritz Hotel will be found dealt with, such as cantilever foundations, column details, wind-bracing, &c. The instruction in structural calculations is particularly clear and well done. Where it is impossible for lack of space to go extensively into any subject, references to other books or sources of information have been given. Part I. of the book is devoted to mensuration rules, weights and measures, &c., Part II. deals with the strength of materials and the stability of structures, and Part III. gives miscellaneous useful information on such subjects as heating, ventilation, chimneys, hydraulics and plumbing, gas and electric lighting, data for estimating cost, and (useful in preparing plans) a glossary of technical terms, with legal definitions, &c. Important proprietary systems and materials are dealt with—not neglected as usual; this is a good feature and shows the book to be a really live one, concerning itself intimately with everyday practice. It is well printed on excellent paper, and the 1,000 illustrations are clear.

"The Architect's and Builder's Pocket-book," by Frank E. Kidder, C.E., Ph.D., F.Am.I.A., &c. New York: John Wiley & Sons. London: Chapman & Hall, Ltd., price 21s.



DESIGN FOR A MEMORIAL. EDMUND L. WRATTEN, ARCHITECT.

Freestone is intended to be used for this memorial, with a copper-covered roof and wrought-iron weather vane on a gilt ball. Oak seats are arranged inside around a square central pier bearing inscriptions on copper plates. Within the dwarf yew hedge surrounding the memorial is a low wall with a flat stone coping, arranged to be used as a seat.

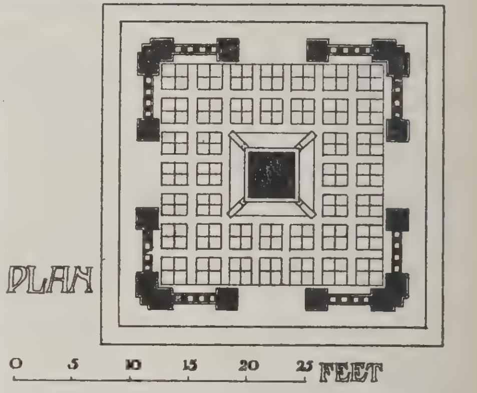
AN INFORMATION BUREAU FOR THE BUILDING TRADES.

MR. ALAN E. MUNBY, M.A., F.C.S., read a paper before the discussion section of the Architectural Association on March 22nd in which he suggested the formation of an information bureau on the products of the building trades' industries. He pointed out that fifty years ago new methods of construction were few and building materials displayed but little diversity as compared with the conditions of to-day, one proof of which was afforded by the number of patents taken out in connection with the building trades, these patents being now about 2,000 annually as against 250 in 1853. The architect could not possibly be expected to know the merits of all these numerous new materials and methods of construction, and in practice he usually confined himself to a few well-trodden paths, making new roads but slowly, and sometimes with disastrous results. There was no opportunity for rapidly obtaining reliable information on the multitudinous novelties introduced. The firms exploiting them were of course ready enough to furnish particulars, but that information could hardly be regarded as unbiased. Therefore, the establishment of an authoritative and trustworthy Bureau would be of inestimable service. It would collect, correlate and systematize facts; it would form a collection of manufacturers' samples, reported upon and classified in conformity with the data obtained; and it would gather statistics (in a readily intelligible form) from relevant work of societies, testing institutions and private experts, and would enter into conference to aid the establishment of standards. Some kind of laboratory and testing department, conducted on utilitarian lines, would certainly be a necessary adjunct to the Bureau. The more elaborate and scientific tests would still be left to private experts, whose *clientèle* would thus be increased rather than diminished by the existence of the Bureau.

Institutions Abroad.

In considering the merits of the scheme it was natural to enquire whether any means for attaining its objects already existed. This enquiry disclosed the fact that extensive and highly valuable work in testing was being carried out by such State-supported, or partially State-supported, institutions as the Reichsanstalt and Versuchenstalt in Germany, the Laboratoire d'Essais in France, the Bureau of Standards in the United States, and our own National Physical Laboratory at Bushey: but though building materials were dealt with by these institutions the great mass of their work lay in testing and research upon scientific instruments and matters more in the field of engineering. Enquiries at the American, French and German consulates in London led to the belief that no institution corresponding to the proposed Bureau existed in these countries. A society called Le Chambre Syndicate des Constructions Metalliques et Industrielles existed, it was true, in Paris, but enquiries as to its work had met with no response. The work of engineering societies, though it rendered valuable assistance, did not cover the field in view; and although the Royal Institute of British Architects, the London Master-Builders' Association and other important bodies had at times done much in connection with some of the objects under discussion, the diversity of their work in other directions hardly rendered it likely that anything in the permanent and organized form proposed could be expected from them. The Yorkshire Federation of Building Trade Employers had a Builders' Exchange at its Hull branch, where there was a collection of building materials, but, it was believed, without any reports thereon, so that the analogy to the suggested Bureau was only slight.

Direction of the Bureau.



The direction of the Bureau would be primarily in the hands of architects, contractors and those engaged in the sale of building goods (but not manufacturers), while, as to its finance, there would be three sources of possible revenue, namely, members' subscriptions, fees paid by makers for reports on their goods, and, possibly, rentals paid by them for space for goods exhibited. If 20 per cent. of London architects and 10 per cent. of London builders and contractors became members at an annual subscription of one guinea, that would furnish about £850; and if 10 per cent. of the remaining architects and 5 per cent. of the contractors in Great Britain contributed half a guinea, an additional £700 would be available; while the subscriptions of those interested in the sale of materials might bring the income up to £2,000. If, in addition, a rental could be charged to manufacturers exhibiting, there would be no difficulty, financially, in the scheme being realized.

From the Census of 1901.

At the conclusion of his paper Mr. Munby gave some figures of patents taken out for building inventions, as well as a list of important materials under trade headings, and the following returns from the census of 1901:—

	County of London.	Rest of England and Wales.
Architects over 25 years of age	1,294	3,550
Building employers	3,040	19,022
Manufacturers of bricks and tiles	29	1,797
,, plaster and cement	19	156
Dealers in timber	443	2,759
,, stone and slate	98	1,419
,, ironmongery and hardware	601	4,790
,, bricks, cements, pottery and glass	310	1,063

[This list represents individuals, not firms, and no allowance is made for agents.]

A discussion followed, opened by Mr. Louis Ambler. Professor Simpson, of University College, was the special visitor in place of Mr. Searles-Wood, who was unable to attend but wrote offering to co-operate in the scheme should any steps be taken. Mr. Smith, Mr. Lishman and Mr. T. H. Russell also spoke. Though some difficulties were suggested in the carrying out of the scheme in its entirety, all the speakers were in favour of the proposals, and the paper was very cordially received, though the attendance of members was small.

Keystones.

A Receiving House for Children is about to be erected in Acton Lane from designs by by Mr. A. Saxon Snell, F.R.I.B.A.

Bishopsgate Churchyard is proposed to be partly built over with shops facing the street, and office accommodation at the rear. Needless to say, the scheme will be strenuously opposed by a large number of the inhabitants, who regard it as wholly uncalled for.

Architects' Registration.—Mr. A. W. S. Cross and Mr. George Hubbard read papers on architects' registration before the York Architectural Society last week, and a resolution was passed declaring emphatically that the Institute should make earnest and immediate effort to secure the desired end.

A new Theatre in Edinburgh is to be erected in Home Street and Leven Street, at an estimated cost of between £60,000 and £70,000, from designs by Messrs. J. D. Swanston & Syme, of Kirkcaldy, the contractors being Messrs. W. S. Cruikshank & Son, of Edinburgh.

A new Salford Day School is being erected in Devonshire Street, Higher Broughton. It will provide accommodation for 280 infants and 500 boys and girls. On each floor there will be a central hall, seven classrooms, and provision is made in separate buildings for the teaching of cookery and manual instruction. The school is estimated to cost £12,380. The site has cost £3,000.

Scottish National Gallery Site Question.—A memorial signed by a number of prominent Edinburgh citizens, including Sir Rowand Anderson and Prof. Baldwin Brown, has been sent to the Secretary for Scotland opposing the suggested removal of the National Gallery to either the High School or Calton Hill. Both of the structures on the Mound are submitted as being better than those named above.

Competitions for Swindon Schools and Rochester Technical Institute.—The Competition Reform Society disapproves of the conditions in these competitions because there is no undertaking that the successful competitors will be employed nor that the assessors' awards will be adhered to, and in the case of the Rochester Technical Institute the remuneration is insufficient. Members are requested to abstain from competing unless the conditions are satisfactorily revised.

Demolishing Adam Houses.—The Penrith Urban Council has decided to proceed with the work of demolishing the houses supposed to have been designed by Robert Adam and recently purchased by them for the purpose of adaptation as a town hall, in spite of the protests of the National Trust, the Society for the Protection of Ancient Buildings, the Right Hon. J. W. Lowther, M.P. for the division, and a petition signed by 250 of the inhabitants. This action is taken on the ground that it is now too late to stop it, the buildings having been purchased and the contracts partly executed.

The R.I.B.A. Prizes and Studentships for 1905-6 are as follows:—*Essay Medal:* "The biography of a British architect (deceased) practising in the nineteenth century." *Soane Medallion:* Realization of the ideal mansion described in Bacon's essay "On Building" (given on p. 352 of THE BUILDERS' JOURNAL for June 13th, 1900), beginning at the words "First then, I say, you cannot have perfect a palace except you have two several sides." *Tite Prize:* Design for an open-air swimming bath with an arcaded or colonnaded enclosure. *Grissell Gold Medal:* Design for a stone skew bridge. Other prizes as hitherto. Full particulars of each are given in a pamphlet issued by the Institute, price 3d.

A new Outpatients' Block at Leicester Infirmary was opened by the Marchioness of Granby last Wednesday. The architects were Messrs. Everard & Pick, and the contractor was Mr. Charles Wright.

The Chapel of the Royal Bavarian Embassy in Warwick Street, Regent Street, W., is being lavishly decorated. In the dome of the apse is to be placed a large mosaic designed by the late Mr. Bentley, architect of Westminster Cathedral.

The largest Rowton House yet built is now practically completed at Camden Town. It will contain 1,100 beds. A new wing is to be added to the Rowton House in King's Cross Road, increasing the accommodation from 678 to 950 beds.

New Board Schools for Edinburgh.—Two new Board schools are about to be erected in Edinburgh—one at Gillespie Street for 1,524 scholars in twenty-six classrooms, and the other in Drummond Street for 652 children in twelve classrooms.

Extensions to the Middlesbrough Isolation Hospital have been erected from designs by the borough surveyor, Mr. Frank Baker. They comprise two additional pavilions accommodating sixty patients, with an allowance of 2,000 cub. ft. of air-space each. The cost of the work has been about £11,500.

A Riding School for the Hull (A) Squadron of the East Riding of Yorkshire Imperial Yeomanry has been built in Walton Street from designs by Messrs. Thompson & Kirton, architects and surveyors, of Hull. The school is what is known as a three-quarter size one —120ft. by 45ft. The floor consists of a ground-work of willows with tan covering. Four arc lamps of 1,000 c.p. each are provided, enabling drills to be carried out with comfort at night time. The total cost, exclusive of furnishing, has been £1,600.

Proposed Ruskin Park.—The Parks Committee of the London County Council recommend the Council to contribute £25,000, half the cost of acquiring twenty-four acres of land at Denmark Hill for the purpose of a public open space to be known as "Ruskin Park." The price asked for the land is at the rate of £2,000 an acre, which the committee are advised is reasonable. The cost of fencing and laying-out will not exceed £5,500, and the annual cost of maintenance will be about £1,000.

Asphalt Pavements.—Observations have recently been made in New York by the Barber Asphalt Paving Co. with the object of ascertaining how much the traffic has increased since 1885, when a similar investigation was made, and how large a tonnage asphalt pavement (in Fifth Avenue) might be able to carry without disintegration. The vehicles in 1885 were 5,460; in 1896, before the street was paved with asphalt, 6,300; and in 1904, 11,789. The average weight per vehicle for 1886 was 0·68 tons, while in 1904 it was 1·64 tons. On Broadway in 1886 it was 1·39 tons and in 1904 1·97 tons. Figures show that a well-constructed asphalt pavement will sustain the heaviest traffic.

A new Theory about Masonry Dams is put forward by Mr. L. W. Atcherley and Mr. Karl Pearson, respectively demonstrator in applied mechanics and professor of applied mathematics and mechanics at University College, London. Briefly stated, the theory is that the vertical sections of a dam under water pressure are more severely strained than the horizontal sections, and that while a dam designed under the rules hitherto applied may be safe as regards cracking horizontally, it may nevertheless be liable to do so vertically. The matter is now engaging the study and attention of the principal mathematicians and hydraulic engineers in England and France. Meanwhile the scheme for raising the Assuan dam is postponed.

Clapham Baths Competition.—We are asked to correct a misunderstanding regarding the Clapham baths, which are to be built for the Wandsworth Borough Council. The accepted design was prepared by Mr. Henry Druery, M.S.A., architect, of 26, Great James Street, Bedford Row, W.C., who was responsible for the architectural work, and by Mr. E. R. Dolby, M.I.C.E., of the firm of Messrs. Dolby & Williamson, consulting engineers, 8, Princes Street, Westminster, S.W., who are responsible for the design of the engineering work. The Wandsworth Borough Council are employing Messrs. Druery and Dolby to carry out the work, and have also instructed them to prepare designs for the proposed Tooting baths. There is, however, no such firm as Messrs. Druery & Dolby, and these gentlemen are only connected in the manner described above.

The Architects' Library.—Messrs. Longmans have a new series of illustrated handbooks in preparation entitled "The Architects' Library," edited by Prof. F. M. Simpson, of University College, London. The series will begin with a three-volume "History of Architectural Development" by the editor, the first volume of which, it is hoped, will be ready this spring. Messrs. Routledge also announce an illustrated "Descriptive Handbook of Architecture" by Mr. M. A. Buckmaster, Art Master at Tonbridge School, intended primarily for those who have no special knowledge of the subject. A book on "Roofs and Floors of New Buildings: Their Structure and Stability," by Mr. Ernest H. Essex, A.M.I.C.E., assistant engineer and surveyor, Leyton, E., will be published shortly by the St. Bride's Press, Ltd. It will give in a concise manner the calculations necessary for the strengths of timbers in floors and roofs.

Decay of Stone and Dry-rot in Timber.—Speaking on this subject on Friday last at the closing meeting of the session of the Glasgow Technical College Architectural Craftsmen's Society, Mr. Alex. Cullen, F.R.I.B.A., insisted on the importance of a proper understanding of the causes of such decay to all engaged in the arts and crafts. The chemical structure of stone was explained as being very closely connected with its weathering properties. The germ theory was also touched upon, as opposed to the action of chemical agencies, in being responsible for decay in stone, the lecturer, however, favouring the older belief. The proper seasoning of stone before its introduction into building was held to be essential. Dealing later with "Dry-rot in Timber," the vegetable growth or fungi causing the disease was described in detail in its origin, its growth, and in its character and appearance. Methods for its prevention and elimination were discussed.

Vauxhall Bridge.—On Tuesday of last week the great steel girders of the central span of the new Vauxhall Bridge, weighing 300 tons, were placed safely in position. An unusually high tide facilitated the work. The girders were floated up on a wooden staging with the flood tide and swung into position. As the tide ebbed they were lowered into position and made secure. It will be remembered that the original plan of the London County Council was to erect a masonry bridge, but this project had to be abandoned as the arches would not have allowed the necessary headroom in accordance with the Vauxhall Bridge Act of 1895. In the amended scheme the masonry piers will rise no higher than is required for the support of the segmental arch structure of steel, and will not be carried up as a decorative feature of the bridge. Over each of the piers the line will be broken by a panel with figures in high relief, and pylons will be erected at the Westminster end of the bridge. It is estimated that the steel superstructure will cost £192,690, and a good many months must elapse before the new bridge is opened for traffic.

LIVE AND DEAD LOADS IN BUILDINGS.

By C. C. SCHNEIDER, M.Am.Soc.C.E.

AN interesting and valuable paper on "The Structural Design of Buildings" was read a short time ago by Mr. C. C. Schneider before the American Society of Civil Engineers, from which we have extracted the following particulars relating to live and dead loads in buildings of the modern type, in which steel forms part of the construction :—

Attention has been called to the great difference in the live loads specified by the various building laws for buildings to be used for the same purpose, the differences being in some cases more than 100 per cent. These differences should be harmonized, and a more rational method of loading devised which would produce a structure of ample strength, more particularly in its details and connections, without waste of material in places where it is not needed.

The writer's attention was first called by Theodore Cooper, M.Am.Soc.C.E., to the irrational practice of specifying a uniform live load per square foot; he thought the specified live loads should be a little more than mere guesswork. Since then the writer has been working in accordance with these suggestions, following the lines which have been recognized for years by engineers in specifying live loads for bridges.

The possible maximum superimposed or live loads on buildings for special purposes, such as warehouses or stores for particular kinds of goods, power-houses, department-stores, &c., after their interior arrangement has been decided upon, can be accurately determined.

However, there are classes of buildings the rooms of which may be occupied for various purposes at various times, such as office buildings, stores, hotels, apartment-houses, dwelling-houses &c. Dwelling-houses are sometimes used for offices, and rooms in office buildings for light manufacturing purposes.

While it is impossible to foresee and provide for all possible contingencies, it is within the limits of possibility to provide for the varying conditions of loading which may occur in a building if used for the purpose for which it was intended.

Live Loads on Floors.

Mr. C. H. Blackall states: "The writer has repeatedly counted the number of persons in the various portions of theatres and music-halls, without once finding, even in crowded aisles and standing-room, an average of more than 40 or 50 lbs. per. sq. ft. extended over more than a few square feet."

This agrees also with the writer's observations.

A live load of 40 lbs. per sq. ft., therefore, may be considered the maximum load to be provided for as a distributed load for all floors on which crowds of people may be expected to congregate, such as all kinds of rooms in dwelling-houses, apartment-houses, hotels, office buildings, schools, churches, theatres, concert-halls, ballrooms, drill-rooms, &c.

Mr. Blackall, in conjunction with Mr. A. G. Everett, made a thorough investigation of the actual existing live loads of three office buildings in Boston. These loads were obtained by taking the actual weights of the furniture and contents and the greatest number of people known to be at any one time in an office, the average weight of one person being estimated at 150 lbs. The greatest load was found in one of the offices of the Ames Building, amounting to 40·2 lbs. per sq. ft.

In only 12·4 per cent. of the offices was the floor load in excess of 25 lbs. per sq. ft., and in only 26 per cent. did it exceed 20 lbs. per sq. ft. The greatest maximum average for all floors of any one of the three buildings was 17 lbs. per sq. ft.

In accordance with these data, it may be considered safe to assume that a distributed live load of 40 lbs. per sq. ft. will be sufficient to provide for a crowd of people as well as for the ordinary loads carried on floors used for offices or similar purposes.

The writer has investigated this subject and endeavoured to discover extreme cases in order to find a method of concentrated loading to cover the same.

For this purpose weights of all kinds of furniture were collected and their contents estimated. The weights were not taken as they actually existed, but as they would be if completely filled with the material for which they were intended.

Furniture: Safes.

It was found that the ordinary furniture, such as desks, tables, wardrobes, counters, chests, small safes, &c., may be discarded for extreme loads. The heaviest concentrated loads found in any office were safes.

The portable safes used in offices rarely ever weigh more than 5,000 lbs., with contents. This load may be carried by one beam, and as a safe of this weight is likely to be placed in any office every floor joist should be calculated for a concentrated load of 5,000 lbs. in any position. The maximum weight of safes generally used in dwelling-houses is 2,000 lbs. The heaviest portable safe manufactured weighs 16,000 lbs., and occupies a floor-space of 69ins. by 45ins. Safes of such excessive weight, however, are not placed on floors of office buildings in which no special provisions are made for them, unless arrangements are made to distribute the load over at least several beams. In offices the weights of all other furniture, with contents, do not approach that of safes.

Drawing-office Cases; Bookcases.

Only a few cases of combinations of extreme loads were found to produce results similar to that of a concentrated load of 5,000 lbs.

In a large room used as an engineering office a number of cases with drawers holding drawings were placed in a double row, back-to-back, in the middle of the room, and used as a table on which to spread drawings. These cases were 31ins. wide and 36ins. high, weighing when completely filled 160 lbs. per lin. ft., or both together 320 lbs. per lin. ft.; but as their total width was 62ins., they may be considered as being carried by two beams.

TABLE 2.—LIVE LOADS ON FLOORS.

Classes of buildings.	Live loads, in lbs.		
	Distributed load.	Concentrated load.	Load per linear foot of girder.
Dwellings, hotels and apartment-houses - - - - - - -	40	2,000	500
Office buildings - - - - - - - - - - - -	40	5,000	1,000
Assembly rooms with fixed seats, like theatres, churches, schools, &c. -	40	5,000	1,000
Assembly rooms without fixed seats, like ballrooms, gymnasia, armouries, &c.	80	5,000	1,000
Stables and carriage houses - - - - - - - - -	70	5,000	1,000
Ordinary stores and light manufacturing - - - - - - -	40	8,000	1,000
Pavements in front of buildings - - - - - - - - -	100	10,000	—
Warehouses and factories - - - - - - - - - -	from 120 up	Special	Special
Charging floors for foundries - - - - - - - - -	,, 300 ,,	,,	,,
Power-houses for uncovered floors - - - - - - - -	,, 200 ,,	The actual weights of engines, boilers, stacks, &c., shall be used, but in no case less than 200 lbs. per sq. ft.	

A case of drawers for drawings, 31ins. by 44ins. and 5ft. high, if completely filled, would weigh 1,200 lbs. As there is a possibility of having a whole row of such cases placed along a partition, this would give a load of 326 lbs. per lin. ft., which may extend the whole length of a beam.

A row of bookcases might be placed on each side of a partition for the whole length of the room, in which case the load would be 340 lbs. per lin. ft. If the partition, instead of running parallel to the beams, should be placed at right angles to them, and if the beams are spaced at the usual distance of 5ft. or 6ft. apart, the concentrated load would be only from 1,700 lbs. to 2,040 lbs. on each beam.

These investigations appear to indicate that a concentrated load of 5,000 lbs. on any point of a beam, and a uniform load of about 340 lbs. per lin. ft. of beam, will probably cover all possibilities of extreme loading of floors used for office purposes.

A concentrated load of 5,000 lbs. is equivalent to the following uniform loads per lin. ft. of beam of different spans :—

Spans - - - -	10	20	30	40
Uniform load per lin. ft.	1,000	500	333	250

If the span of the beam is 30ft. and more, then the load of 340 lbs. per lin. ft. would govern. However, as offices are rarely more than 30ft. long, and as the probability of having an available continuous space of more than 30ft. on each side of a partition fully occupied with bookcases, completely filled, is extremely small, and when it is considered that this load will not be carried entirely by one beam, the floor acting as a distributor, this may safely be neglected, and it may be assumed that a concentrated load of 5,000 lbs. covers all ordinary contingencies.

In order to have a comparison between the system of concentrated loading and the uniform loads usually specified, Table 1 gives the equivalent loads per sq. ft. for beams of different lengths and spacing.

TABLE 1.

Span of beam, in feet.	Distance between centres of beams, in feet.			
	4	5	6	7
10	250	200	166	143
15	166	133	111	95
20	125	100	83	71
25	100	80	66	57
30	83	66	55	48
35	72	57	48	41
40	62	50	42	36

The application of a concentrated load to each beam has the additional advantage of having all beam-connections proportioned for a load of 5,000 lbs., and, therefore, not only obtains stronger connections and additional stiffness, but also makes provision for excessive concentrated loads during erection.

A concentrated load of 5,000 lbs. applied to floor girders, that is, girders which carry beams, is not sufficient to cover all cases of extreme loading.

By laying-out a great number of arrangements of office floors, with different spacings of columns and beams, and by applying different combinations of maximum loads, it was found that a uniform load of 1,000 lbs. per lin. ft. of girder will generally cover all possible contingencies, unless the uniform load of 40 lbs. per sq. ft. gives greater results.

The floor girders, therefore, have to be tried by three methods in order to ascertain which gives the greatest result:—

(1) For a concentrated load of 5,000 lbs.

(2) A uniform load of 1,000 lbs. per lin. ft.

(3) A uniform load of 40 lbs. per sq. ft. of floor area.

This method of loading as specified for office buildings will also provide ample safety if any rooms should be used for light manufacturing purposes.

By applying, in actual examples, the rules for floor loads of office buildings, as recommended by the writer, it is found, if the columns are spaced at 20ft. between centres in either direction, and the beams at 5ft. between centres, that the live load on the beams will be equivalent to 100 lbs. and on the girders 50 lbs. per sq. ft. of floor area.

If the columns were spaced at 25ft. between centres, and the beams 5ft. as before, the live load would be equal to 80 lbs. per sq. ft. on the beams and 40 lbs. per sq. ft. on the girders.

For buildings occupied as dwellings a concentrated load of 2,000 lbs. is recommended for beams and a uniform load of 500 lbs. per lin. ft. for girders, in connection with a uniform floor load of 40 lbs. per sq. ft.

As it has been demonstrated that a uniform load of 40 lbs. per sq. ft. will scarcely ever be exceeded by a crowd of people, this load, with the excess loads specified for office buildings, will be sufficient for floors of schools, churches, theatres and places where seats are provided, but for places where strong vibrations may be expected, such as ballrooms, drill-rooms, gymnasia, &c., 100 per cent. should be added to the uniform live load for impact and vibration, and in order to reduce the deflections, and consequently the vibrations, the depth of the beams and girders should be limited to $\frac{1}{15}$ of their span.

Loads on Columns.

It has been the practice of many engineers and architects to allow smaller live loads on columns than those specified for the floor system, or to reduce the loads per square foot of floor area on columns from storey to storey downward toward the foundations. Rules to that effect are also incorporated in some building laws.

In the specifications proposed by the writer the rules of the New York building laws have been adopted, viz., to reduce the live load on columns in buildings more than five storeys high 5 per cent. for each storey (commencing with the columns carrying the second floor from the top) until a reduction of 50 per cent. is reached.

In order to provide for any possible excessive loads, and to keep the dimensions of the lighter columns within reasonable limits, it is specified that columns carrying floor loads shall be proportioned for a minimum live load of 20,000 lbs., and the proportion of length divided by least radius of gyration of section shall be limited to 125.

Applying these rules to the columns of an office building gives for the columns carrying the top floor a live load of 40 lbs. per sq. ft. of floor area (unless this load is exceeded by the concentrated load of 20,000 lbs.), which is reduced to a minimum load of 20 lbs. per sq. ft. This agrees very closely with the investigations of Messrs. Blackall & Everett, who found the average maximum live load on any one office floor to be 40·2 lbs. per sq. ft. and the average total maximum for any one building to be 17 lbs. per sq. ft.

Loads on Foundations.

Several failures which have resulted from unequal settlement of foundations have demonstrated that it is of the utmost importance that foundations should be proportioned properly, more particularly those not on solid rock or where a settlement is to be expected. The reason for some of these failures was that the foundations were proportioned for the theoretical live loads, which never occurred. During construction, when the dead loads caused a settlement, those foundations which received the smallest amount of live load, therefore, were strained nearly to the limit of the permissible pressure, while those with a large amount of live load received a very much smaller pressure per sq. ft., thus causing unequal settlement.

For many years it has been the practice to reduce the live loads on foundations to less than the amounts allowed on the footings of columns, a provision which also exists in some building laws. However, as the average live load in a fireproof building is only 20 lbs. (or less) per sq. ft., and the dead load on the interior columns approximately 100 lbs. per sq. ft., and on exterior columns considerably more, and as the foundations have generally reached their maximum settlement before the building is occupied, it seems that the logically correct way to proportion foundations would be to consider the dead load only, but reduce the pressure per sq. ft. so that the permissible pressure for combined dead and live load will not be exceeded. For example:—

The base of that foundation which gets the greatest live load in proportion to the dead load has—

lbs.	
100,000	live load.
400,000	dead load.
500,000	

The permissible pressure on the base of the foundation is 2 tons, or 4,000 lbs. per sq. ft., and this foundation therefore would require an area of 500,000 divided by 4,000, equalling 125 sq. ft., which, if the live load be omitted, would give a pressure of 3,200 lbs. per sq. ft. for dead load alone. Therefore all foundations in this building should be proportioned so that the pressure from the dead load alone will not exceed 3,200 lbs. per sq. ft.

Wind Loads.

All structures are exposed to high-wind pressures occasionally, and there have been many disasters caused by structures having been blown down by the wind. All cases of this kind can be traced to inadequate provision in the design to resist these forces. It is not sufficient to compute the wind strains on the exposed surface of the finished building and depend upon the walls and partitions for bracing. The steel frame of a building is generally run up ahead of the walls and partitions. In several instances the framework of buildings has been wrecked during erection, or has been blown out of plumb and has had to be pulled back into place. Sometimes temporary wooden braces or temporary adjustable rods have been used to hold the framework in line during erection. In one case the framework was so flimsy and shaky that the erectors were afraid to work on it, and in order to make it safe during erection tied it together with wire ropes. Certainly this was not good practice. The steel frame of a building should be treated as an independent structure, the same as the towers of a viaduct, and should be able to resist the wind forces on all surfaces exposed during erection. This should be accomplished by substantial bracing, or by designing the columns and connections so that they may be able to resist the bending strains produced by wind-pressure. No temporary makeshifts should be allowed. This method has the advantage of imparting additional stiffness to the framework.

In proportioning the members of the structure for these temporary wind strains it is permissible to allow a higher unit strain than for permanent work, say 20,000 lbs. per sq. in., or about two-thirds of the elastic limit.

Unit Strains.

The permissible pressures allowed on foundations on different kinds of soil, on concrete, masonry, brickwork, &c., have been compiled from different sources

The permissible unit strains on steel are specified as 16,000 lbs. per sq. in., which is approximately one-half of the elastic limit; therefore giving a factor of safety of 2. This is in accordance with the best practice now in vogue for bridge work.

Foundations. — Permissible pressure on foundations, in tons per sq. ft.:—

Soft clay and wet sand	1
Ordinary clay and dry sand mixed with clay	2
Dry sand and dry clay	3
Hard clay and firm, coarse sand	4
Firm coarse sand and gravel	6

Masonry.—Permissible working pressure in masonry, in tons per sq. ft.:—

Common brick, lime mortar	7
Common brick, Rosendale cement mortar	8
Common brick, Portland cement mortar	10
Hard-burned brick, Portland cement mortar	12
Rubble masonry, lime mortar	5
Rubble masonry, Rosendale cement mortar	6
Rubble masonry, Portland cement mortar	8
Coursed rubble, Portland cement mortar	[illegible]

Concrete for walls:—

Rosendale cement, 1-2-5	8
Rosendale cement, 1-2-4	9
Portland cement, 1-2-5	[illegible]
Portland cement, 1-2-4	[illegible]

Pressure on Wall-plates.—Pressure of beams, girders, wall-plates, column bases, &c., on masonry not to exceed the following:—

	lbs. per sq. in.
On brickwork with cement mortar	150
On rubble masonry with cement mortar	150
On Portland cement concrete	250
On first-class masonry, sandstone	200 to 300
On first-class masonry, limestone	300 to 500
On first-class masonry, granite	400 to 800

Bearing Power of Piles.—Maximum load carried by any pile not to exceed 40,000 lbs. Piles driven in loose wet soil not to be strained to more than 350 lbs. per sq. in. of their average cross-section. The safe load on wooden piles to be determined by the following formula:—

$$P = \frac{2\ WH}{s \text{ plus } 1}$$

where P = safe load on pile, in tons;

H = distance of free fall of hammer, in feet;

s = penetration of the pile for the last blow, in inches.

Permissible Strains in Steel.—All parts of the structure to be proportioned so that the sum of the dead and live loads, together with the impact, if any, shall not cause the strains to exceed the following:—

	lbs. per sq. in.
Tension, nett section	16,000
Direct compression	16,000
Shear, on rivets and pins	12,000
Shear, on bolts	8,000
Shear, on plate-girder web (gross section)	10,000
Bearing pressure, on pins and rivets	24,000
Bearing pressure, on bolts	16,000
Fibre strain, on pins	24,000

For wind bracing, and the combined strains due to wind and the other loading, the permissible working strains may be increased 25 per cent., or to 20,000 lbs. for direct compression or tension.

Permissible Compression Strains.—For compression members, the permissible strains of 16,000 and 20,000 lbs. per sq. in. to be reduced by the following formula:—

$$p = 16{,}000 - 70\frac{l}{r}$$

$$p = 20{,}000 - 90\frac{l}{r}$$

where p = permissible working strain per sq. in. in compression;

l = length of piece, in inches, from centre to centre of connections;

r = least radius of gyration of the section, in inches.

Loads on Roofs.

Flat roofs of office buildings, hotels, apartment-houses, &c., which are likely to be loaded by crowds of people, need to be treated as floors, and the same live loads used as specified for hotels and dwelling-houses.

Ordinary roofs should be proportioned to carry the following loads per sq. ft. of exposed surface, applied vertically, to provide for dead and live loads combined :—

Gravel or composition roofing :—	
On boards, flat pitch, 3ins. to 12ins. or less	45 lbs.
On boards, steep pitch, more than 3ins. to 12ins.	40 lbs.
On 3in. flat tile or cinder concrete	55 lbs.
Corrugated sheeting, on boards or purlins	50 lbs.
Slate :—	
On boards or purlins	50 lbs.
On 3in. flat tile or cinder concrete	65 lbs.
Tin on steel purlins	55 lbs.

[For roofs in climates where no snow is likely to occur, the foregoing total loads may be reduced by 10 lbs. per sq. ft.]

Large roofs, such as train-sheds, armouries, public halls, &c., should be proportioned to carry, in addition to their own weight—

A live load, representing snow, per horizontal sq. ft. of roof of—

15 lbs. for all slopes not exceeding 35 degs.

10 lbs. for all slopes between 35 degs. and 45 degs.

The possibility of a partial snow loading has to be considered. The snow load can be neglected in certain climates, also in roofs having slopes exceeding 45 degs., if there are no snow-guards or other obstructions.

The timber parts of the structure to be proportioned in accordance with the following :—

UNIT STRAINS, IN LBS. PER SQ. IN.

Kind of timber.	Transverse loading.	End bearing.	Columns under 12 diameters.	Bearing across fibre.	Shear along fibre.
White oak	1,300	1,300	1,000	500	500
Long-leaf pine	1,500	1,500	1,000	350	100
White pine and spruce	1,000	1,000	700	200	100
Hemlock	800	800	650	200	100

Columns, the length of which exceeds twelve times their least diameter, to be proportioned by the following formula :—

$$p = \frac{C}{1 + \frac{l^2}{1{,}000d^2}}$$

where C = unit strains, as given in above table, for short columns ;
c = length of column, in inches ;
d = least side of column, in inches.

(*To be concluded.*)

Obituary.

Mr. Edward M'Geoch, retired builder and contractor, of Seacombe, Liverpool, died recently.

Mr. Thomas Cosham, builder, of Newark, inventor of the Cosham precipitating tank system of sewage-disposal, died recently.

Mr. J. B. Arding, A.R.I.B.A., senior member in the firm of Arding, Bond & Buzzard, architects and surveyors, London, W.C., died on March 10th, aged 76.

Mr. Charles Pertwee, A.R.I.B.A., formerly surveyor to the Chelmsford Corporation, died on March 19th, aged 73. He was architect of many churches, chapels, hospitals and schools.

Mr. F. S. Waller, architect, of Gloucester, died last Wednesday evening, aged 82. For many years he had charge of Gloucester Cathedral, and was associated with the late Sir Gilbert Scott and Mr. J. L. Pearson on the restorations carried out from time to time. He was also largely associated with church restoration in the diocese and elsewhere.

Mr. Ellis H. Pritchett, F.R.I.B.A., F.S.I., died recently, aged 47. He was chief officer of the Swindon Fire Brigade, member of Council of the National Fire-Brigades' Union, and a member of the Executive of the British Fire Prevention Committee. He was a member of the Committee's special fire commission which visited the principal cities of Central Europe last year, and was the holder of the Royal Humane Society's medal for saving four lives.

Law Cases.

Ownership of Drawings : Important Appeal.—The case of *Gibson* v. *Pease* came before the Court of Appeal on Friday last. This was an appeal from the judgment of Mr. Justice Ridley on the trial of an action without a jury. The action was brought by a building owner to recover possession of certain plans and specifications from an architect. The facts were as follows :—In September, 1902, the plaintiff engaged the defendant as architect and surveyor to carry out the conversion of the upper parts of some houses in Queen's Road, Bayswater, into residential flats—at the usual 5 per cent. commission. The defendant prepared plans and specifications and superintended the work of conversion, which was completed in June, 1903. The plaintiff paid defendant his fees and claimed to have the plans and specifications handed over to him. The defendant, on the other hand, claimed to be entitled to retain them. Thereupon this action was brought; and at the trial evidence was tendered on the part of the defendant of a custom in the profession by which, in circumstances like those of the present case, the plans and specifications were the property of the architect. Mr. Justice Ridley refused to admit the evidence, being of opinion that the case was governed by the authority of *Ebdy* v. *McGowan* (2 Hudson on Building Contracts, 7). The learned judge gave judgment for the plaintiff, but granted a stay of execution pending an appeal. The defendant appealed. The Court dismissed the appeal.—Counsel for the defendant said the case raised a point of law on which the Royal Institute of British Architects desired to have the judgment of the Court. The contract made by an architect was not to sell a plan but a contract for work and labour. Generally, an architect undertook to prepare plans and to see that they were properly and skilfully executed for his employer. No doubt the building owner was entitled to the benefit of the use of the plans, but the pieces of paper on which they were drawn did not belong to him. There was no reason why the architect should not be entitled to make use of the plans in his future work for other clients. When the work was carried out the property in the plans remained in the architect. In France and Germany the law was that the architect kept the plans but was bound to supply the client with copies. They were not now concerned to consider whether there was any such obligation on an architect in this country; the only question was as to the property in the plans. They contended that the defendant was entitled to retain these plans.

The Master of the Rolls

said that, in his opinion, this case was clearly covered by the principle of the case of *Ebdy* v. *McGowan*. The principle on which counsel for the defendant relied in support of the alleged right of an architect to retain plans was that the architect's contract was not a contract for the sale of a chattel but for work and labour, and that the contract was performed when he had superintended the building of the house. Was that principle involved in *Ebdy* v. *McGowan*? There the plaintiff was an architect who had been employed by the defendant to prepare plans and get tenders for a vicarage. The payment was to be 5 per cent. on money expended if the vicarage was completed ; if tenders were obtained and work not commenced, 3 per cent. on the estimated cost ; if no invitations for tenders issued, 2½ per cent. The plans were prepared, but the defendant changed his mind and declined to proceed, and wrote to the plaintiff offering to pay, and asking for the plans. The architect declined to give up the plans, but sued for payment, and set up a custom among architects to retain their plans if the work was not proceeded with. It was held by the Court of Exchequer that such custom, even if proved, would be unreasonable, and that the defendant need not pay for the plans unless he got them. In his opinion the principle relied on by counsel for the defendant was just as much involved in that case as in this. If the custom had been justified in that case, it must have been justified on the same contention as that on which it was sought to justify it here. If the custom was bad in one case it must be equally bad in the other. The decision seemed to him to be good law, and he thought they ought to follow it. In his opinion, therefore, Mr. Justice Ridley was right and the appeal must be dismissed.—The Lords Justices delivered judgment to the same effect.

THE NEW ADMIRALTY BUILDINGS.

THE second visit of the Northern Polytechnic Building Students' Association took place on Saturday last at block III. of the new Admiralty buildings, St. James's Park, by kind permission of the architects, Messrs. Leeming & Leeming, FF.R.I.B.A. A splendid set of drawings was shown by Mr. Spencer Green, the clerk of works, great interest being evinced in the drawings of the underpinning to the old Admiralty building. The ground floor of the new building consists of the entrance hall running from front to back, on either side of which are offices. From this floor two main staircases communicate with the upper floors. Above the ground floor the building has a large open area in the centre, lined with glazed bricks, which lights the offices and corridors, besides supplying light to the entrance hall and rooms on the ground floor by means of double top-lights. Ventilation is provided for by means of inlets in the external walls at about 7ft. above the floors, and extracts in the ceilings connected to the main trunk to be carried up in the towers. The heating system is not at present commenced. Provision is made for all wires, &c., to run in channels in the floors, and for all plumbing work to be carried in chases in the walls. The whole of the building to St. James's Park is faced with Portland stone, the back elevation being faced with red rubbers with stone dressings. Fire-resisting construction is adopted throughout, Fawcett's patent tiles being used in the floors and all partitions and roofs being composed of coke-breeze concrete. Great care had to be taken in connecting the new building with the old, as the old walls were for the most part outside casings of brickwork filled in with brick-rubbish. The work of underpinning the old structure was doubtless one of the largest works of its kind ever undertaken in London, it being no less than taking the whole of the footings of the old building down in solid concrete to the London clay at a depth of 50ft. below the level of Whitehall. This was occasioned by the nature of the subsoil not being able to support the extra weight of a new tower. The subsoil in Westminster is saturated with water, which finds its way down from North London, the water normally standing at a height of 24ft. above the London clay level. The whole of the new building stands in a concrete basin resting on the London clay. The contractors for the addition are Messrs. Holloway Brothers.

Mr. Douglas Wiles, in the borough engineer's office at Norwich, has been appointed architect and surveyor to the Denbighshire County Council at a salary of £650 and expenses.

Mr. Benjamin J. Greenwood has been elected president of the Institute of Builders for the current year, and Messrs. Woodman Hill and James Carmichael vice-presidents.

THE ARCHITECTURAL ASSOCIATION.

Mr. Needham Wilson on Sketch Plans and Working Drawings.

A MEETING of the Architectural Association was held on Friday evening at 18, Tufton Street, Westminster, the chair being occupied by the president, Mr. E. Guy Dawber, F.R.I.B.A.

The following additional donations to the New Premises Fund were announced :—

	£	s.	d.
Carpenters' Company	26	5	0
F. & H. Higgs	25	0	0
Charles Smith & Co.	10	10	0
Bath Stone Firms	5	5	0
R. C. Murray	5	5	0
Nottingham Architectural Society	5	5	0
G. P. Bankart	4	4	0
Holliday & Greenwood	3	3	0
G. Lucas	2	12	6
T. J. Wetherall	2	12	6
J. B. Chubb	1	1	0
Ewart & Son	1	1	0
W. H. Hewish	1	1	0
E. E. Lofting	1	1	0
H. P. G. Maule	1	1	0
Maurice E. Webb	1	1	0
T. H. Russell	1	1	0
C. E. Varndell	1	1	0

Votes of condolence were passed with the relatives of Mr. C. B. Arding and Mr. H. D. Aubrey. Mr. Arding was the oldest member of the Association, having first joined in 1848.

Mr. A. Needham Wilson, A.R.I.B.A., then read a paper on "Sketch Plans and Working Drawings." These, he said, furnished one of the compensations of architectural practice. Yet they had their drawbacks, for when those first enthusiastic conceptions, so brilliantly drawn, came back mutilated beyond recognition, and the architect was bidden to carry out the building from the poor remains, then indeed he felt this was a hollow world. It was astonishing, however, how great a sense of gratification might be derived from a good drawing. The dullest routine work became interesting, and even a detail of a riveted girder could be made attractive in skilful hands. That was how he looked at it. How the client looked at it was another matter; but how the builder looked at it was soon found out if enthusiasm had led one astray from the path of working-drawing veracity.

The Consideration of the Means by which an architect translated his ideas and conceptions into hard matter-of-fact bricks and mortar must always be of interest to architects, if not to anyone else.

How many outside the profession had the smallest conception of the process which had to be gone through to enable the architect to erect his building? Even those who were best informed had no idea that an architect did anything more than spend a pleasant hour or two occasionally in toying with a pencil and colours and producing pretty sketch plans which, when approved, were handed over to the clever builder, who turned the thing into a structural success. The ring of the trowel, the hammer's thud, the crisp sound of sawing, were realities —something tangible—whereas the means by which the architect achieved his end were a silent unseen force, and therefore unknown. It never struck the client that **the Slight Sketch Plans,** with everything so perfectly arranged, were the result of much anxious thought and expenditure of midnight oil. He never dreamt that the ingenious arrangements which fitted together so well were integral parts of a harmonious whole, and he would probably indulge in some cheeseparing economies which upset the balance of the architect's scheme. It was nothing to him that the features he wiped out so light-heartedly had cost hours of patient labour and thought, and that the architect must again draw together his scheme and endeavour to cast over the mutilated remains the glamour of his individuality. And if this were so of the sketch plans, which the client necessarily must see, what of the working drawings, which he only saw when signing the contract? Yet the architect plodded on, taking delight in his obscure sketch plans, and he sent his dashing sketch to the client, not wholly actuated by sordid motives, but anxious to express his ideal in as favourable a manner as he could for the very love of it. Nevertheless, these sketches and sketch plans had a great deal to answer for; they had, in fact, been known to induce a client to spend more money than he originally intended; and unless this were artfully worked it led to trouble, for the client said to his friends, "Most expensive man, that architect fellow; made me spend far more than I wanted." Still, it was surprising how a client might be led on by a judicious succession of sketch plans.

Ownership of Drawings.

On the other hand, they might lead him to expect something that he did not get. Then he was dissatisfied and felt defrauded. Also, sketch plans occasionally led to costly estimates and the abandonment of the work. Then the would-be client declined to pay for them, and the architect had to decide between a lawsuit and endeavouring to live on what pleasure he could extract from making beautiful drawings. This, said Mr. Needham Wilson, was what he was told; but he did not believe it. Indeed, he saw sometimes from the papers that clients liked the plans so much that they insisted on keeping them. Some, indeed, claimed a legal right to do so. Why, when they bought a picture, did they not claim the painter's colours and brushes? "As the opposite to the man with a passion for architects' plans, commend me to the man who does without plans, and who employs a builder to erect a *pot-pourri* of details sneaked from other buildings, and who pats himself on the back in appreciation of his cleverness in saving architects' fees."

Advance in Water-colour Work.

The great advance that had been made in water-colour work was not the least striking sign of development in the profession. The lecturer said he could well remember the time when the power to turn out a water-sketch of real merit was in the hands of a few men of conspicuous ability.

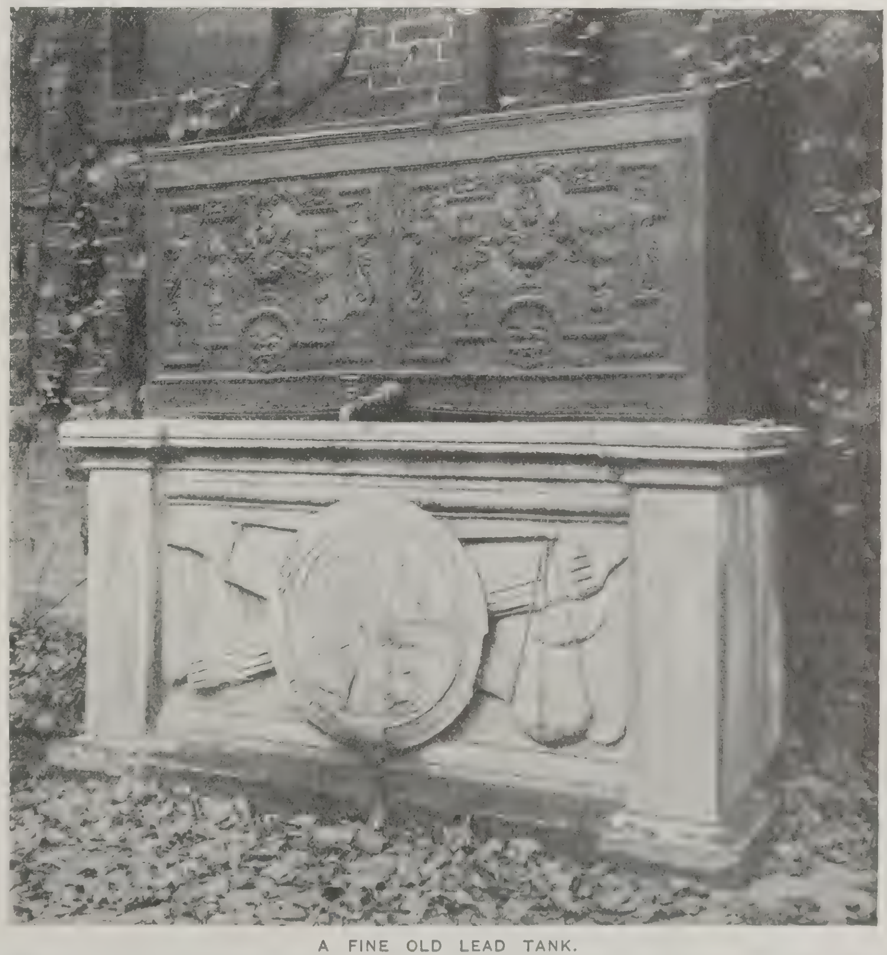
To-day almost every man could handle a brush, and more often than not in a most creditable way. To this desirable end the Association had contributed much. It used to be a complaint that the drawings on the walls at the Royal Academy were the work of specialists employed to give fictitious merit to the designs. The fictitious merit might still be there, but at least it was now most usually the work of the designers themselves. Personally he did not think working drawings and details should cover the walls at the Royal Academy. He thought the buildings should be represented there as they would appear when executed.

Unnatural Points of View.

It was natural that the average client should wish to see how his building would look when completed, and from an actual point of view and in its actual surroundings. He should not be expected to transform himself into a bird for the time being, or to view the building from the upper floor of an adjoining building. How many architects took the trouble to sketch the actual setting for their building—so essential to the ultimate effect?

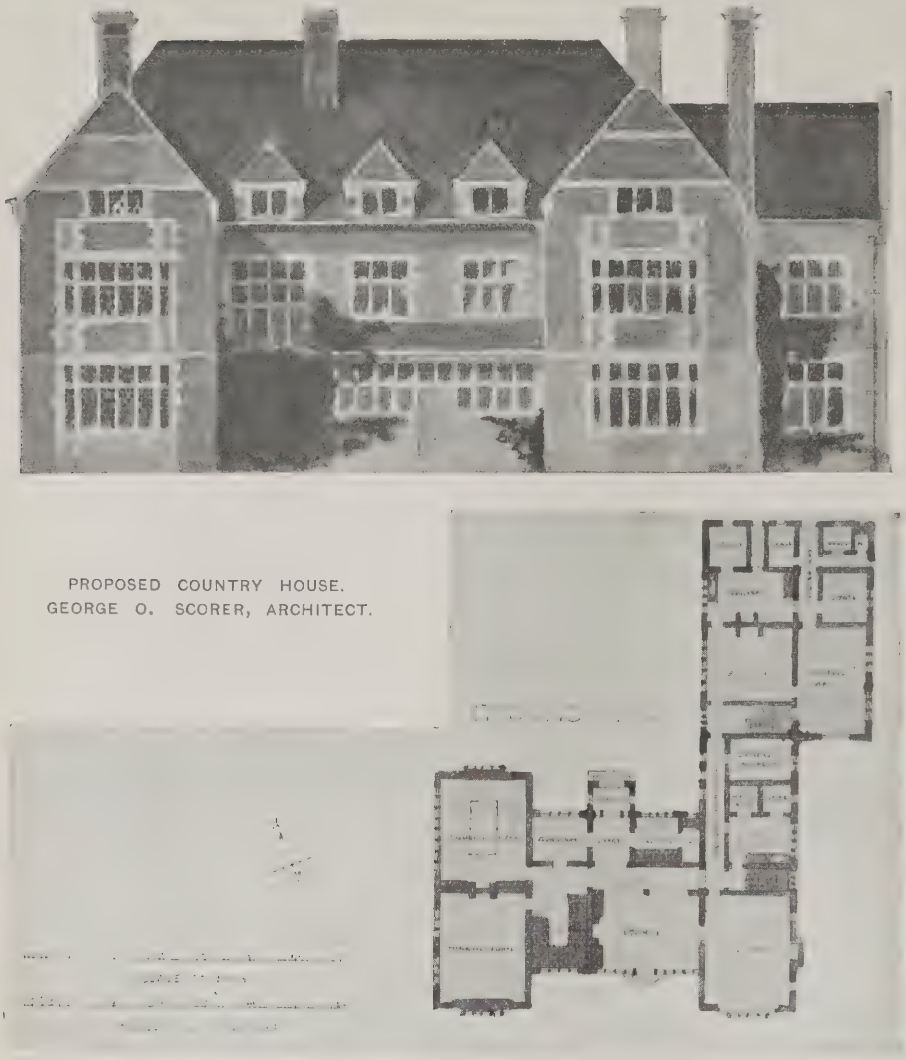
Details.

It would scarcely be denied that the art of the draughtsman had made enormous progress during the last twenty years or so. But this progress had somewhat outstripped the advance in our architecture, and in examining the work of students of late he found a decided tendency to slur over the study of details. Careful consideration of parts was sacrificed to effect in the drawing, and the



A FINE OLD LEAD TANK.

This fine old tank, dated 1745, is situated in a garden at the back of one of the houses in Great Ormond Street, W.C., next to the Hospital for Sick Children. The house was once occupied by Lord Chancellor Thurlow (1732-1806)—hence the emblematical representations on the stone pedestal of the tank.



PROPOSED COUNTRY HOUSE.
GEORGE O. SCORER, ARCHITECT.

architecture was subordinate to a prettily-coloured sketch.

Crude Working Drawings.

But what should be said when these methods were applied to working drawings; when the traditional manner of distinguishing materials gave place to artistic colouring, and thick ink lines left a considerable margin for conjecture on the part of the quantity surveyor or builder!

Only recently he heard of an instance where the skilful artist who prepared certain drawings contrived to tint some stonework to that the unlucky surveyor confidently took it as timber. Anyone who had seen a disconsolate foreman trying to scale with a 2ft. rule from a ⅛in. plan drawn by a modern draughtsman would readily understand that the architect must not be too particular to 3ins. or so.

The Moral.

The moral was that the methods which were legitimate in sketch plans required modification in working drawings—no difficult matter in these days of sun prints. Probably the process by which careful and accurate working tracings were made from the sketch plans commended itself to many, and better preserved the spirit of the original conception than a translation into a series of carefully-worked-out pencil drawings prior to such tracing. He thought it would be generally agreed that a surprising loss of original freshness and spice might occur when the first conception was filtered through a number of re-drawings.

Every Man His Own Method.

In such a paper as this any attempt to lay down rules for others would savour of impertinence. Indeed, criticism would be out of place. Each man must necessarily use the means which he found best suited to his purpose, and the mere observer could only comment; for between the man who supplied his builder with the slightest material in the shape of working drawings and the man who furnished him with elaborate and fully figured and written-up drawings lay such a wide field of experience and custom working towards the same end that any attempt to harmonize them would be futile. The one man expected his builder to enter into his mind and identify himself with the thoughts of which the drawings were only the expression—maybe an inadequate expression. Neither the builder nor the builder's men had been trained to this, and the question of success might largely depend upon how the architect could imbue them with his individuality, how fire them with his enthusiasm, how stamp his work with that indefinable something which could not be expressed on paper. The other man, practical to his fingers' ends, found himself in conflict with a building financier and workmen trained in technical schools, and in an honest attempt to combine art and practice succeeded in imparting a certain hardness to his work which he found displeasing and which he could not understand.

Training of Workmen.

There could not be two opinions as to which of the two methods was preferable, but, unhappily, until we trained our workmen differently and something of our old craftsmanship methods could be recovered we were labouring under great disadvantages. It seemed to the lecturer that two forces were operating—an artistic force and a technical force—and on conflicting lines. Nor were we doing much to harmonize these forces. He thought that, as a body, we should have a far larger say in the training of our workmen and should turn the effort for technical instruction in the right direction. New constructional methods born of the technical schools were creeping into use mainly where the architect ignored such points in his artistic working drawings; and, personally, though desiring to be progressive, Mr. Needham Wilson said he had grave doubts whether these new methods were improvements on the old, and he was sure the actual workmanship was inferior. Did not many draughtsmen seem to fear that they would lose the beauty and interest of the design if the working drawings were elaborated? In detailing, no time was begrudged to the strictly architectural part, but too often the constructional niceties were left to the imagination. It was a hardship, perhaps, to imply that the little tricky methods and mannerisms which lent spice to a drawing should be abandoned; but were not many of them meretricious and meaningless, and confusing to the builder?

Old-New Buildings.

It was a sore temptation to give to one's working drawings the little deft touches which suggested that the hand of Time had already dealt kindly with the building as yet on paper only. The "cocked-up" apex of a gable, caused by the sagging of weak timbers, certainly added piquancy to an old building, and on a drawing one was tempted to exaggerate the tilt of a double cube verge to soften the stiffness of straight lines, but the deliberate imitation of such effects by false construction was bad in principle.

An Example.

He knew of an unfinished house where the architect had not only suggested that his ridges had dropped a foot below the gables, but had by artificial means given a wavy line to the main ridge and a sagged appearance generally to portions of the roof. He might have built his walls out-of-plumb while he was about it, laid his floors out of level, and thrown in a few settlements. What was the effect? That of an interesting piece of architecture, with all the glamour of age to soften its angularities? Not at all. It suggested an ordinary bit of modern work with an extremely ill-constructed roof. He only trusted it might be condemned as a dangerous structure by the local surveyor. Such methods were a dragging of architecture in the mire, and totally unworthy of the high ideals we ought to sustain. But were they not the logical outcome of the new draughtsmanship pushed to extremes?

He did not in any sense advocate a return to the old methods. He did not desire for a moment to return to the days of "hair" lines and stock colours of distressing rawness to indicate materials. He only advocated the keeping of the great development in draughtsmanship within legitimate limits without the aid of false and tricky methods.

The French and the Americans.

The French beat us handsomely with their official work and, despite their academic training, without slavish adherence to Classic prototypes. But we had not much to learn from them in the matter of draughtsmanship, unless it were the scrupulous care with which their drawings were prepared. We might certainly gain something by an examination of their studies for carving.

In America they were considerably ahead of us in draughtsmanship, despite French training, and they had struck out on vigorous lines characteristic of the nation.

There would be an immense field before the man who could invent a method

For Registering Our Thoughts

as the camera registered the desired view. It would save much distasteful routine work. We did not know what the science of the future might have in store for us, but it was to be hoped no savant would devise means for thinking a building into existence, for then we should lose much that delighted and compensated in our sketch plans and working drawings.—A discussion followed.

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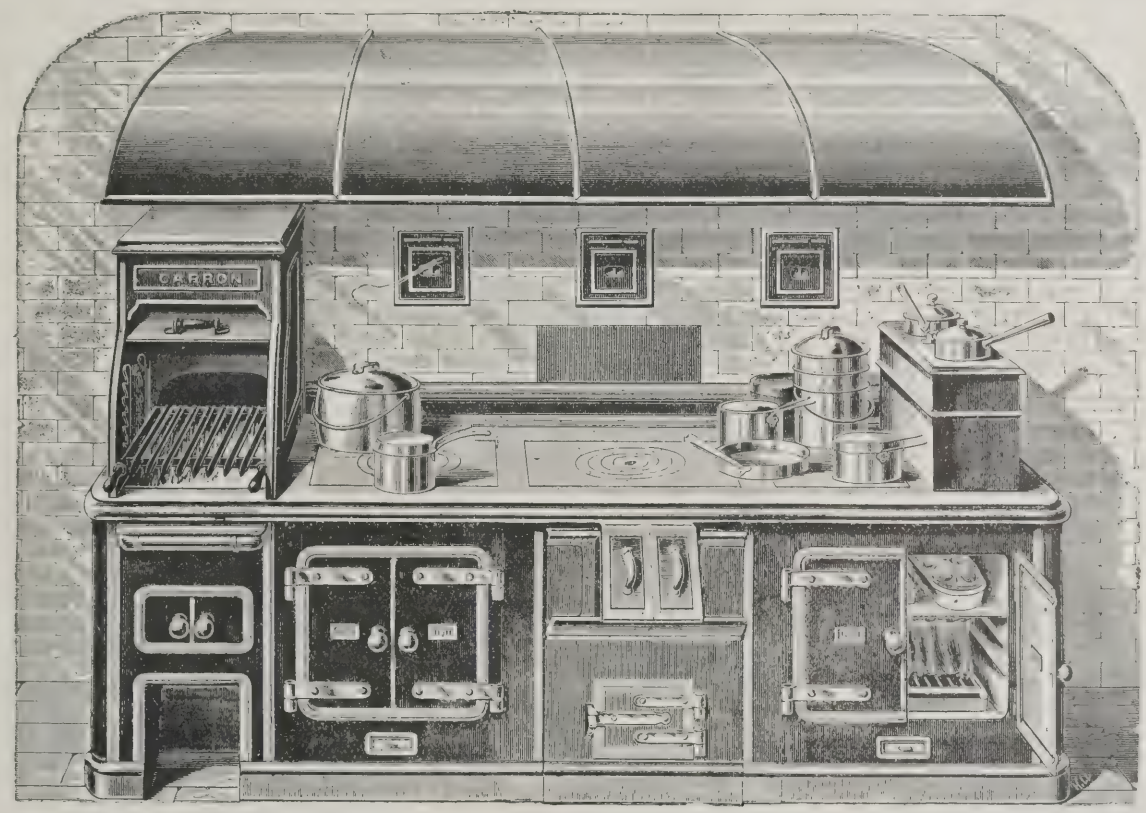

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Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
March 30	Abercynon, Wales—Two Shops, &c.	——	A. L. Thomas, Pontypridd.
,, 30	Barnsley—House	——	R. & W. Dixon, 5 Eastgate, Barnsley.
,, 30	Cross Keys, Mon.—Offices	United National Collieries, Ltd.	Colliery Office, Cross Keys.
,, 30	London, S.E.—Alterations, &c., to House	Guardians	G. D. Stevenson, 13 King Street, E.C.
,, 30	South Brent, Devon—Farmhouse	——	Mr. Kingwell, Mann Aish.
,, 31	Macclesfield—Sanitary Blocks	——	H. Beswick, Newgate Street, Chester.
,, 31	Shilbottle, Northumberland—Two Houses	Sir William Church	M. T. Wilson, Architect, Alnwick.
,, 31	Wootton Bassett—Offices and Covered Way	Armstrong & Son	R. J. Beswick, 10 Victoria Road, Swindon.
,, 31	Elgin, N.B.—Church	——	W. C. Reid, Architect, Elgin.
,, 31	Cork—Additions, &c., to Premises	——	W. H. Hill & Son, 28 South Mall, Cork.
,, 31	Cwmfelin Monach, Wales—Chapel	——	Vestry Room, Cwmfelin.
,, 31	Cattal, near York—Two Sets of Refractory Cells	Yorkshire Inebriates' Act Joint Committee.	County Hall, Wakefield.
,, 31	Allendale Town, Northumberland—Hall	——	Heatherlea, Allendale Town.
,, 31	Hereford—Church	——	Nicholson & Hartree, Hereford.
,, 31	Rhostyllen, near Wrexham—Chapel	——	S. Thomas, High Street, Rhostyllen.
,, 31	Whitehaugh, N.B.—Alteration to Stables, &c.	——	James Comfort, Gardener, Whitehaugh.
,, 31	New Tredegar, Wales—90-100 Houses	Powell Duffryn Workmen's Building Society.	George Renshole, Station Road, Bargoed.
,, 31	Taunton—School	Education Committee	G. H. Kite, Municipal Buildings, Taunton.
,, 31	Alvie, N.B.—Hospital	County Council	A. Cattanach, Architect, Kingussie.
April 1	Lamorran, Cornwall—Wain House	——	Farmhouse, Tregenna.
,, 1	Wath Brow, Cumberland—Reading-room	——	Reading-room, Wath Brow, Cleator Moor.
,, 1	Brentwood—Mortuary Building at Asylum	County Lunatic Asylum	F. Whitmore, Duke Street, Chelmsford.
,, 3	Whitehaven—Library	——	T. Brown, Town Hall, Whitehaven.
,, 3	Goole—Swimming Bath	Urban District Council	E. H. Barber, Council Offices, Goole.
,, 3	Bewcastle—Bridge	Longtown R.D.C.	C. B. Hodgson, The Courts, Carlisle.
,, 3	Carlisle—Stone Bridge	Highways and Bridges Committee.	G. J. Bell, The Courts, Carlisle.
,, 3	Ebbw Vale, Mon.—Alteration, &c., to School	Education Committee	H. Waters, Beaufort.
,, 3	Eccles—School	Corporation	Town Clerk's Office, Eccles.
,, 3	Greystoke, Cumberland—Two Bridges	Highways and Bridges Committee	G. J. Bell, The Courts, Carlisle.
,, 4	Carlisle—Barn	Burial Joint Committee	Clerk's Office, 27 Lowther Street, Carlisle.
,, 4	Ebbw Vale, Mon.—Caretaker's House	Urban District Council	T. J. Thomas, Town Surveyor, Ebbw Vale.
,, 4	King's Heath, Birmingham—Library	Urban District Council	A. W. Cross, 23 Valentine Road, King's Heath.
,, 4	Belfast—Chancel, &c.	Select Vestry of All Saints	W. J. Fennell, 2 Wellington Place, Belfast.
,, 4	Cwmparc, Wales—Alterations, &c., to Hotel	Messrs. Treharne	W. D. Morgan, Victoria Chambers, Pentre.
,, 4	Mitcham, Surrey—Gasholder Tank	District Gaslight Co.	Company's Works, Mitcham, Surrey.
,, 5	Batley—Library	——	Hanstock & Sons, Branch Road, Batley.
,, 5	Consett, Durham—Additions to Inn	Mr. T. Clayhill	"Traveller's Rest Inn," Consett.
,, 6	Radcliffe—Registrar's House and Mortuary Chapel	Urban District Council	W. L. Rothwell, Council Offices, Radcliffe.
,, 6	Cardiff—Filter- and Meter-house	Corporation	C. H. Priestley, Town Hall, Cardiff.
,, 6	Middlesbrough—Demolition of Old Buildings	Cemeteries Committee	Robert Marshall, Cemetery Superintendent, Middlesbrough.
,, 6	Southend-on-Sea—School	Education Committee	R. Langton, Clarence Street, Southend.
,, 7	Orpington, Kent—Smallpox Hospital	Joint Hospital Board	J. Ladds, 93 Pemberton Road, Harringay, N.
,, 8	St. Merryn, Cornwall—Chapel	——	Rev. W. A. Lawson, The Manse, Padstow.
,, 10	Tunbridge Wells—Engine-house	Tonbridge R.D.C.	Frank Harris, Engineer to Council, Broadway, Southborough, Tunbridge Wells.
,, 10	Ystalyfera, Wales—One Detached and Two Semi-detached Villas.	——	Glen View, Ystalyfera.
,, 10	Antrim, Ireland—Alterations, &c., to Premises	Mr. James Baird	W. J. Fennell, 2 Wellington Place, Belfast.
,, 10	Ballywater, Ireland—Alterations, &c., to Cottages	Lord Dunleath	W. J. Fennell, 2 Wellington Place, Belfast.
,, 11	Ilford—Extension of School	Education Committee	C. J. Dawson, 11 Cranbrook Road, Ilford.
,, 14	Swindon—School	Education Committee	W. Seaton, Education Office, Town Hall, Swindon.
,, 15	Abertaf, Abercynon, Wales—School	Mountain Ash U.D.C.	W. G. Thomas, Public Offices, Mountain Ash.
,, 15	Boston, Lincs—Infirmary, &c.	Guardians	James Rowell, Church Lane, Boston.
,, 18	Ashton-in-Makerfield—Infectious Diseases Hospital Extension.	Urban District Council	Albert Sykes, Clerk to Council, Ashton-in-Makerfield.
,, 26	King's Norton—Library	Urban District Council	A. W. Cross, 23 Valentine Road, King's Heath.
May 1	Rochester—Technical Institute	Corporation	W. Banks, City Surveyor, Rochester.
No date	Heighington, Durham—Alterations, &c., to Property	——	Mr. Horton, "George and Dragon Inn," Heighington.
,,	Cardiff—Grain Warehouses	Grain Co., Ltd.	G. A. Birkenhead, Caledonian Chambers, Cardiff.
	ENGINEERING:		
March 30	Bolton, Lancs—Coolers, &c.	Electricity Committee	A. A. Day, Electrical Engineer, Spa Road, Bolton.
,, 30	Bradford—Motor Generators	Corporation	Electricity Offices, Whitaker Buildings, Bradford.
,, 30	Stockport—Feeder Cables	Gas and Electricity Committee	A. J. H. Carter, Milgate, Stockport.
,, 31	Salford—Wiring School	Corporation	Borough Elec. Engineer, Elec. Works, Frederick Road, Pendleton.
,, 31	Halstead, Essex—Oil Engine	Urban District Council	W. A. Nicholson, Surveyor, Halstead.
,, 31	Houghton-le-Spring, Durham—Sewage Tanks	Urban District Council	J. W. Holbrook, Surveyor, Houghton-le-Spring.
,, 31	Herne Bay—Heating Apparatus	Urban District Council	F. W. J. Palmer, Council Offices, Town Hall, Herne Bay.
,, 31	Hindley, Lancs—Condensers	Gas Committee	H. O. Timmins, Gasworks, Hindley.
,, 31	Shanghai—Electric Tramways	Municipal Council	J. Poor & Co., 63 Leadenhall Street, E.C.
April 1	Lulea, Sweden—Dredging	——	Harbour Office, Lulea, Sweden.
,, 1	Richworth, Yorks—Tank	Urban District Council	Horsfall & Son, 22A Commercial Road, Halifax.
,, 1	Woking—Foundations, &c.	Gas Co.	A. Valon, 140 Temple Chambers, E.C.
,, 3	Smithston, near Gartly, N.B.—Bridge	District Committee	J. Barron, Central Chambers, 216 Union Street, Aberdeen.
,, 3	Kidwelly, Wales—Storage Tanks	Town Council	T. Arnold, Castle Buildings, Llanelly.
,, 3	Landore—Hot-water Heating Apparatus	Committee of New Siloh Chapel	J. Richards, 54 Cwpydd Road, Landore.
,, 4	Birmingham—Tramway Cars	Tramways Committee	A. Baker, 254A Corporation Street, Birmingham.
,, 4	Dartford—Heating Apparatus	Metropolitan Asylums Board	Office of Board, Embankment, E.C
,, 4	London, S.W.—Motor Generators	London County Council	County Hall, Spring Gardens, S.W.
,, 4	Manchester—Switchboards	Electricity Committee	F. E. Hughes, Electricity Department, Town Hall, Manchester.
,, 5	Woolwich—Work to Heater Rooms, &c.	Metropolitan Asylums Board	Office of Board, Embankment, E.C.
,, 5	London, W.—Boiler Flues	Hammersmith Borough Council	G. G. Bell, Electricity Works, 85 Fulham Palace Road, W.
,, 6	Arbroath, N.B.—Waterworks	Corporation	Crouch & Hogg, 53 Bothwell Street, Glasgow.
,, 7	Shinfield, near Reading—Rebuilding Bridge	Berks County Council	J. Morris, Broadway Buildings, Reading.
,, 7	Convoy, Ireland—Engine, &c.	Woollen Co., Ltd.	Woollen Co., Ltd., Convoy.
,, 8	Huntingdon—Water Mains	Urban District Council	E. Borissow, Borough Surveyor, Huntingdon.
,, 10	Glasgow—Electricity Generating Plant	Trustees of Clyde Navigation	T. R. Mackenzie, 16 Robertson Street, Glasgow.
,, 10	St. George's Harbour, Bermuda—Deepening, &c., Channel	Government	Coode & Son & Matthews, 9 Victoria Street, S.W.
,, 11	Bantry, Ireland—Waterworks	Rural District Council	Board Room, R.D.C., Bantry.
,, 15	Boston, Lincs—Heating Buildings, &c.	Guardians	J. Rowell, Church Lane, Boston.
May 1	Suakin (Red Sea)—Lighthouse	Ports and Lights Administration	Deputy-Controller-General, Ports and Lights Administration, Alexandria.
	IRON AND STEEL:		
March 30	Newcastle-on-Tyne—Screws, Bolts, &c.	Tramways Committee	Tramways Department, Head Office, Manors, Newcastle.
,, 30	Salford—Pipes	Gas Committee	W. W. Woodward, Gas Offices, Bloom Street, Salford.
,, 30	Cairo—Iron Hoop, &c.	——	War Department Stores, Citadel, Cairo.
,, 31	Harwich—Pipes	Gas & Coke Co.	G. Baines, Secretary, Harwich.
,, 31	Stockport—Hurdles, &c.	Cleansing Committee	J. Atkinson, Borough Surveyor, Stockport.
,, 31	Brighton—Ironfounder's Work	Corporation	F. J. C. May, Town Hall, Brighton.
April 3	Verulam, Natal—Pipes	Local Board	G. B. Laffan, Hardy's Chambers, Printing Office St., Pietermaritzburg.
,, 5	Glasgow—Steel Wheels, &c.	Corporation	J. Dalrymple, 46 Bath Street, Glasgow.
,, 5	Dartford, Kent—Iron and Steel	Metropolitan Asylums Board	Office of Board, Embankment, E.C.
,, 15	Prestwich—Iron Manhole Covers, &c.	Urban District Council	W. Nuttall, Chester Bank, Prestwich.
	PAINTING AND PLUMBING:		
March 23	Bromyard—Oils, &c.	Rural District Council	R. O. Smith, District Surveyor, Bromyard.
,, 29	Dorchester—Oils, &c.	Town Council	Borough Surveyor, Dorchester.
,, 30	Newcastle-on-Tyne—Paints, &c.	Tramways Committee	Tramways Department, Head Office, Manors, Newcastle.
,, 31	Brighton—Painters' Work	Corporation	F. J. C. May, Town Hall, Brighton.

Complete List of Contracts Open.—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		PAINTING AND PLUMBING—*cont.*		
April	1	Shrewsbury—Painting Interior & Exterior of Market Hall	Estates Committee	W. C. Eddowes, The Square, Shrewsbury.
,,	5	Glasgow—Paint Brushes	Corporation...	J. Dalrymple, 46 Bath Street, Glasgow.
,,	5	Hither Green, S.E.—Painting Work at Hospital	Metropolitan Asylums Board ...	Office of Board, Embankment, E.C.
,,	13	London, S.E.—Painting Interior & Exterior of Workhouse	Guardians	E. P. Fenton, 283 Tooley Street, S.E.
,,	13	Halifax—Painting Interior of Town Hall	Finance Committee	J. Lord, Town Hall, Halifax.
,,	15	Prestwich—Paints, &c.	Urban District Council	W. Nuttall, Chester Bank, Prestwich.
		ROADS AND CARTAGE:		
March	30	Cleethorpes, near Grimsby—Street Works	Urban District Council	Surveyor, Council House, Cleethorpes.
,,	30	Gateshead—Cement Path Work...	———	W. Swinburne, Town Hall, Gateshead.
,,	30	Gravesend—Road Materials	Town Council	D. R. Robbs, 6 Lord Street, Gainsborough.
,,	30	Guildford—Flints	Corporation...	C. G. Mason, Tuns Gate, Guildford.
,,	30	Huddersfield—Street Works	———	G. & G. H. Crowther, 38 New Street, Huddersfield.
,,	30	Chatham—Road Materials...	Town Council	C. Day, Town Hall, Chatham.
April	1	Croft, near Darlington—Whinstone	Rural District Council	C. H. Leach, Union Offices, Darlington.
,,	1	Leeds—Tar Macadam	Parks Committee	City Engineer's Office, Leeds.
,,	1	Pocklington, Yorks—Stone	Rural District Council	T. Robson, Clerk, Pocklington.
,,	1	Sandwich, Kent—Road Materials, &c....	Town Council	Town Clerk's Office, Potter Street, Sandwich.
,,	1	Stafford—Road Materials, &c.	County Council	J. Moncur, County Buildings, Stafford.
,,	3	Truro—Road Metalling	City Council	M. Lea, City Surveyor, Truro.
,,	3	Felixstowe—Asphalt, &c.	Walton U.D.C.	H. Clegg, Town Hall, Felixstowe.
,,	3	Brierfield, Burnley—Paving, &c., Street	Urban District Council	B. Halstead, Town Hall, Brierfield.
,,	3	London, S.E.—Kerbing, &c.	Lewisham Borough Council ...	Surveyor's Department, Town Hall, Catford.
,,	4	Epsom—Road Materials	Rural District Council	T. E. Ware, Surveyor to Council, Waterloo Road, Epsom.
,,	5	Hove, Sussex—Tar Paving	———	H. H. Scott, Borough Surveyor, Town Hall, Hove.
,,	5	Swansea—Pavements	Rural District Council	Council Offices, Alexandra Road, Swansea.
,,	5	Glasgow—Granite, &c.	Corporation...	J. Dalrymple, 46 Bath Street, Glasgow.
,,	10	St. Mellon's, near Newport—Road Metalling...	Rural District Council	Union Offices, Queen's Hill, Newport, Mon.
,,	10	Chelmsford—Granite	Guardians	W. W. Duffield, 96 High Street, Chelmsford.
,,	10	Magor, Wales—Metalling	Rural District Council	Union Offices, Queen's Hill, Newport, Mon.
,,	13	Helmsley, Yorks—Stone	Rural District Council	R. Pearson, Clerk, Helmsley.
,,	15	Prestwich—Road Materials	Urban District Council	W. Nuttall, Chester Bank, Prestwich.
,,	15	Tenterden, Kent—Road Materials	Corporation...	W. L. C. Turner, Town Hall, Tenterden.
		SANITARY:		
March	30	Wortley, Sheffield—Scavenging	Rural District Council	G. E. Beaumont, Surveyor, Grenoside.
,,	30	Drogheda, Ireland—Sewer Works	Guardians	Clerk's Office, Union, Drogheda.
,,	31	Featherstone, Yorks—Sewage Works	Urban District Council	Council Offices, Featherstone.
,,	31	Renfrew—Scavenging	Committee of Scavenging District	J. R. Parker, 76 Fulbar Street, Renfrew.
,,	31	Rugby—Sewers, &c.	Rural District Council	T. W. Willard, Surveyor to Council, Rugby.
April	3	Frinton-on-Sea—Sewer	Urban District Council	E. M. Bate, Council Offices, Frinton-on-Sea.
,,	4	Keighley—Sewer	Special Drainage Committee ...	W. H. Hopkinson, Borough Engineer, Keighley.
,,	5	Middleton, Lancs—Sewers	Corporation...	W. Welburn, Town Hall, Middleton.
,,	10	Norton, Sheffield—Emptying Ashpits	Rural District Council	T. Smith, Clerk, The Edge, Sheffield.
,,	10	Dore and Totley, near Sheffield—Emptying Ashpits ...	Rural District Council	T. Smith, The Edge, Sheffield.
,,	10	Tunbridge Wells—Sewerage Works	Tonbridge R.D.C.	F. Harris, Broadway, Southborough, Tunbridge Wells.
,,	11	Glasgow—Sewer	Corporation...	City Engineer, 64 Cochrane Street, Glasgow.
,,	15	Prestwich—Disinfectants	Urban District Council	W. Nuttall, Chester Bank, Prestwich.
		TIMBER:		
April	3	Cape Town—Hardwood Sleepers and Timber	Commercial Intelligence Branch of Board of Trade.	Offices of Commercial Intelligence Branch of Board of Trade, 73 Basinghall Street, E.C.
,,	5	Glasgow—Timber	Corporation...	J. Dalrymple, 46 Bath Street, Glasgow.

List of Competitions Open.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &C.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
March	30	London, S.W.—Municipal Buildings...	———	£1	H. J. Smith, Town Hall, Kennington, S.W.
,,	31	Chippenham—School	£30 & £20	———	W. Pullinger, Education Department, County Offices, Trowbridge.
,,	31	London, S.E.—Clock Tower	£20, £15 & £10	———	Thomson & Pomeroy, 49 Hill Road, Wimbledon.
,,	31	Trowbridge—School	£30 & £20	———	W. Pullinger, Education Department, County Offices, Trowbridge.
April	5	Maesteg, Wales—Chapel	———	———	W. G. Roberts, Secretary, Llysderfel, Maesteg.
,,	14	Swindon—School...	£5 per cent.	———	W. Seaton, Education Office, Town Hall, Swindon.
,,	17	Cardiff—Libraries	£75 & £50	———	Chief Librarian, Central Libraries, Cardiff.
May	15	Rochester—Institute	£50, £21 & £10 10s.	———	W. Banks, City Surveyor, Rochester.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Aberbeeg (Mon.).—For the erection of a chapel and schoolroom, for the Primitive Methodist Connexion. Mr. R. L. Roberts, architect, Abercarn :—

Gaen Brothers	£1,753	16	0
R. Tudor	1,685	0	0
M. Adams*	1,364	11	3
J. Jenkins, Newport	1,360	0	0
D. Powell...	1,218	3	0

* Accepted. [Rest of Abertillery.]

Burton-upon-Trent.—For alterations to the town hall, for the Corporation. Mr. Henry Beck, architect, 10, High Street, Burton-upon-Trent :—

J. & J. Hunter, Moor Street	£3,950
H. Edwards, Blackpool Street	3,897
G. Hodges,* Horninglow Street	3,765

* Accepted.

Coundon (Bishop Auckland).—For the erection of a Roman Catholic elementary school. Mr. J. Keenan, architect, North Bondgate, Bishop Auckland :—

W. Hope & Son, Coundon...	£2,176	15	0
P. C. Scott, Aycliffe, Darlington ...	1,964	10	7
W. Walton, Crook	1,839	0	0
W. Hudson, Bishop Auckland... ...	1,811	18	1
Walton Brothers, Crook	1,737	12	9
T. Manners,* Bishop Auckland ...	1,707	16	9

* Accepted.

NOTE.—The tender of Mr. Atkinson, Coundon, mason, excavator and bricklayer, at £881 12s. 9d., is accepted with that of Mr. Manners, joiner, the latter being the sole tender.

Etwall (Derby).—For alterations and additions to the Council schools, for the Managers. Mr. Arthur Eaton, architect, 6, St. James's Street, Derby :—

Radford & Greaves	£1,892	0	0
H. Vernon	1,580	0	0
Goodwin, Etwall	1,579	0	0
Parker & Son	1,529	0	0
Dickinson...	1,528	0	0
Wood, Hilton...	1,500	0	0
Kershaw, Burton	1,500	0	0
Walker & Son, Wirksworth	1,465	0	0
Chattle	1,460	0	0
Warner Brothers, Mickleover	1,443	6	
Walker & Slater	1,450	0	0
Ford & Co.	1,399	0	0
Brown & Son	1,398	0	0
Derby Builders, Ltd.	1,391	2	6
H. Bakewell	1,363	3	5
J. Liggins...	1,356	0	0
Pegg & Bailey*	1,265	7	9

* Accepted. [Rest of Derby].

(*Continued on p. xviii.*)

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A LADY TYPIST SHORTHAND WRITER, 26 (Pitman's Metropolitan School), desires RE-ENGAGEMENT in London office. London experience; excellent refs. Salary moderate.—Box 1031, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT and CIVIL ENGINEER'S ASSISTANT desires ENGAGEMENT. 10 years' practical experience of surveys, drawings, quantities, &c. Excellent references.—Box 992, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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ARCHITECT and SURVEYOR'S JUNIOR ASSISTANT desires RE-ENGAGEMENT; 3½ years' experience. Knowledge of construction and levelling.—Apply A. B., 48, Thornton Avenue, Chiswick, W. 1029

ARCHITECT'S ASSISTANT, aged 26, 9 years' London and provincial experience; designs, working drawings, quantities, and perspectives, &c.—A. S. R., 100, Crompton Road, Handsworth, Birmingham. 1016

ARCHITECT'S ASSISTANT (24) desires situation; contract drawings: details, &c.; surveying, assistance with quantities; good experience.—Box 1040, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S ASSISTANT seeks ENGAGEMENT. Details and contract drawings, surveys and levelling, knowledge of quantities and specifications, experienced in schools; salary moderate.—E. A. DUKIN, Barrowcliff & Allcock, Architects, Loughborough. 1000

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1036.—BUILDER'S CLERK, P.C. accounts, quantities, assist with estimating; 16 yrs. in last berth.
1038.—ARCHITECT AND CONTRACTOR'S ASSISTANT; 6 yrs. exp.; construction, levelling, surveying, drainage, &c. Shorthand, typewriting, specifications, measuring up; mod. s.
1039.—YOUNG MAN (21) wishes to learn plumbing;. trade, painter and grainer; small wage.
1042.—SHOP OR GENERAL FOREMAN, used to machinery and management; qualifications and references.
1043.—GENERAL FOREMAN, age 40; trade, bricklayer; abstainer.
1044.—SURVEYOR OR SANITARY INSPECTOR'S ASSISTANT; 6½ yrs. exp. of building trades.
1045.—TRACER (20), in drawing office of Engineers; 5½ yrs. e p. with large city firm; good refs.
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See p. xxii *for the Employment Register.*

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Competitions Open.

BOROUGH OF SWINDON.
COMPETITIVE PLANS FOR PUBLIC ELEMENTARY SCHOOL.

The Education Committee of the Town Council of Swindon propose to erect a PUBLIC ELEMENTARY SCHOOL, with accommodation for 840 scholars, and invite PLANS from architects.

A block plan of the site, together with conditions and instructions, may be obtained from Mr. W. SEATON, Secretary to the Education Committee, Education Office, Town Hall, Swindon.

No premium is offered, but the author of the selected Plans will be entrusted with the carrying out of the work at a commission of £5 per cent.

Plans to be delivered by 14th APRIL, 1905
ROBERT HILTON,
Town Hall, Swindon, Town Clerk.
2nd March, 1905.

Contracts Open.

BOROUGH OF KEIGHLEY.

BRICK SEWER.

The Special Drainage Committee invite tenders for the construction of about 575 yards of eggshaped and circular brick sewer. Tenders to be received by the 4th April. Full particulars from the undersigned.
W. H. HOPKINSON, A.M.I.C.E.,
Borough Engineer.

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TO BUILDERS AND CONTRACTORS.

The Trustees of the Coedsaeson Building Club are prepared to receive Names of Persons willing to TENDER for the ERECTION of about 10 PAIRS OF VILLAS, according to Plans, Specifications, and Quantities prepared by Mr. B. C. DEACON, Architect, Central Buildings, Liverpool, to whom applications should be sent not later than MARCH 31st, 1905.
W. NICHOLS, Secretary.

BROMLEY and BECKENHAM JOINT HOSPITAL BOARD.
SMALL-POX HOSPITAL, ORPINGTON, KENT.

The Bromley and Beckenham Joint Hospital Board are prepared to receive TENDERS for the ERECTION of a SMALL-POX HOSPITAL, in Crotton Heath Wood, in the Parish of Orpington, Kent, in accordance with plans and specifications prepared by their Architect, Mr. JOHN LADDS, of 93, Pemberton Road, Harringay, London, N.

Application for quantities to be made in writing to the Architect not later than 25th MARCH, enclosing a Bank of England five-pound note, as deposit for a copy of the quantities, which will be returned on receipt of a bonâ fide Tender.

Due notice to the applicants will be given where and when the plans can be seen.

Tenders, endorsed "Tenders for Small-pox Hospital," to be delivered to the undersigned at Park House, Bromley, Kent, on or before THREE o'clock on FRIDAY, the 7th APRIL next.

The lowest or any Tender will not necessarily be accepted.

(Signed) FRANK H. GEDNEY,
Office of the Board, Clerk to the said Board.
Park House, Bromley.

TO BUILDERS, PAINTERS, &c.
ROYAL ANCHOR HOTEL, LIPHOOK, HANTS.

Persons willing to TENDER for REPAIRS, INTERNAL and EXTERNAL PAINTING, PAPER-HANGING and other works at this Hotel are requested to communicate with Mr. WILLIAM G. LOWER, Architect, No. 12A, High Street, Guildford.

The specification of the works can be seen at the Hotel.

March 22nd, 1905.

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I.—Free Monthly Advertisements.

1. A Free Advertisement of 12 words in the Wanted or Miscellaneous Advertisement Columns, in one issue of the BUILDERS' JOURNAL during each calendar month will be given to any regular reader.

2. The charge of one penny will be made for each additional word.

3. Advertiser's Name and Address or Box Number must be counted, but will in no case be reckoned as more than five words.

4. All advertisements must be accompanied by the correct remittance, and should a receipt be required a stamped addressed envelope must be enclosed.

5. The Proprietors reserve to themselves the right of refusing any advertisement.

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1. The services of a large staff of experts are at the disposal of all regular readers who require information on architectural, constructional or legal matters.

2. Questions should in all cases be addressed to the Editor, and be written on one side of the paper only.

3. Correspondents are particularly requested to be as brief as possible.

4. The querist's name and address must always be given, not necessarily for publication

Note.—Owing to the large number of enquiries we receive weekly, we are compelled to restrict the advantages of this department to Regular Readers.

III.—Free Accident Insurance of £500.

1. Every regular reader of the BUILDERS' JOURNAL is entitled to the benefit of this Insurance.

2. A Pamphlet giving full details of this and other Insurance schemes inaugurated by the BUILDERS' JOURNAL for the benefit of its readers, and guaranteed by "The Ocean Accident Corporation, Limited," will be sent on application.

What is a Regular Reader?

We have employed the term "Regular Reader" throughout these announcements as the description "subscriber" is often understood to mean one who subscribes direct to the publishing office.

We mean by a Regular Reader anyone who has placed an order with us or any newsagent or bookstall for the BUILDERS' JOURNAL for one year.

Those readers who order the BUILDERS' JOURNAL through their local newsagent or bookstall should send us the newsagent's receipt. Their names will then be placed on our subscribers' list, and they will be entitled to all the advantages set out above.

5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS.
OFFICE: 6, GREAT NEW STREET, FETTER LANE, E.C.

TENDERS—*cont. from p.* xv.

Cobham (Surrey).—For the erection of Sandroyd School, for Messrs. C. P. Wilson & W. M. Hornby. Messrs Treadwell & Martin, architects, 29A, Charing Cross Road, London, W.C. Quantities by Mr. H. Williams Mellor, 17, Buckingham Street, Adelphi, London, W.C. :—

	School buildings.	Chapel.	Soil and rainwater drains, septic tank and rainwater tank.
Ashby Brothers, 6, Union Court, E.C.	£17,470	£1,800	£764
W. Johnson & Co., Ltd., Wandsworth Common	16,550	1,700	700
F. & H. F. Higgs, Loughborough Junction	16,420	1,660	710
F. G. Minter, Putney	16,001	1,769	759
Holliday & Greenwood, Ltd., Brixton	15,649	1,600	700
Martin, Wells & Co., Ltd., Aldershot	15,050	1,600	650

Llandilo.—Accepted for the erection of a dwelling-house and cottage, with stable, at George, for Mr. W. R. Jones. Mr. D. Jenkins, architect, Llandilo :—

W. Evans, Ammanford	£1,774 10 0

London, S.E.—For the erection of a dwelling-house in the Manor Way, Lee Road, for Mr. H. McAuliffe. Mr. Leonard V. Hunt, F.R.I.B.A., architect :—

Green	£2,150
Collingwood	2,117
J. V. C. Bowyer	2,083
L. Whitehead & Co.	2,038
W. Akers & Co.	1,887
Kennard Brothers*	1,848

* Accepted.

London, N.—For making-up Winifred Place, North Finchley. Mr. F. D. Thomson, architect and surveyor, The Oaks, Woodside Park, North Finchley, N. :—

Smith & Son	£180 0 0
Louke & Son	154 0 0
Peake	87 10 0
Holliday & Son	83 8 6
Smith & Jeffries	79 4 7

London, N.—For alterations and repairs to house, Nether Street, North Finchley. Mr. F. D. Thomson, architect and surveyor, The Oaks, Woodside Park, North Finchley, N. :—

Smith	£135 0 0
Peake	124 0 0
Holliday	118 10 0

London, N.W.—For the enlargement of the Willesden sorting-office, for H.M. Office of Works :—

		A.
E. J. Clayton	£1,945 10 0	£91 10 0
G. Neal	1,832 0 0	20 0 0
Snewin Brothers & Co.	£1,740 0 0	£174 0 0
J. E. Johnson & Son	1,668 0 0	20 0 0
C. Ansell	1,650 0 0	30 0 0
W. J. King	1,604 16 0	74 16 0
B. E. Nightingale	1,590 0 0	50 0 0
General Builders, Ltd.	1,589 0 0	22 0 0
W. Norton	1,580 0 0	25 0 0
Pollard & Brand	1,580 0 0	125 0 0
J. Christie	1,574 10 0	76 0 0
Speechley & Smith	1,570 0 0	90 0 0
Banyard & Son	1,558 0 0	78 0 0
F. T. Chinchen & Co.	1,544 0 0	95 0 0
Aldridge & Son	1,515 0 0	77 0 0
Martin, Wells & Co.	1,498 0 0	18 0 0
E. A. Roome & Co.	1,495 0 0	46 0 0
T. Pearce	1,490 0 0	--
G. Wiggs	1,486 0 0	102 0 0
Cowley & Drake	1,391 16 3	53 7 6
C. Simmons	1,367 0 0	69 0 0
J. Shelbourne & Co.*	1,316 0 0	24 0 0

* Accepted. A.—Credit for old materials.

London, S.E.—For the erection of factory premises at Mountford Place, Kennington, for Messrs. Hayward Brothers, Ltd. Mr. A. W. Tribe, architect, 120, Clapham Road, S.W. :—

G. Brittain	£1,495
G. Hoare & Sons	1,489
W. Smith & Son	1,475
J. Parsons	1,474
Hibberd Brothers, Ltd.	1,450
F. & F. H. Higgs	1,423
Rice & Son*	1,333

* Accepted.

(Continued on p. xx.)

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Made in 70 Colours

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Hall's Distemper only requires water added to be ready for use.

Its covering power is unequalled by any similar material. One cwt. of Hall's Distemper will cover double the surface of one cwt. of pure white lead paint, with 40% less cost in labour.

Good walls require no preparation.

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Velinheli, Penrhyn, and Westmoreland.
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Both Plain and Enamelled.
ALFRED CARTER & CO., LIVERPOOL.

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White line on blue ground, and dark line on white ground.
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NEW REVISED PRICE LIST POST FREE.
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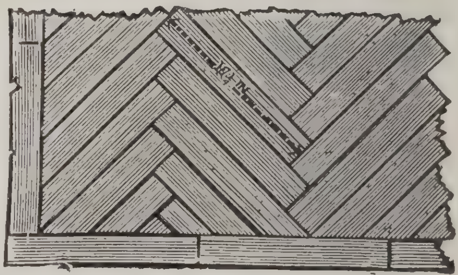

Per 100 Blocks out of sizes.	YELLOW.		PITCHPINE
	At Wharf.	ex Ship within one Month.	At Wharf.
17¼ × 3 × 3	12 9	12 0	16 6
17¼ × 3 × 2	8 3	7 9	11 5
17¼ × 3 × 1½	6 9	6 3	9 0

PRIME DRY OAK & PITCH PINE FLOORINGS
With Special Joint to conceal Nails—
1¼ × 4 Oak, 56/9 Pitch Pine 27/- per square.
1 × 4 " 45/- " 22/9 "
These prices do not include desiccation.
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For Mullions, Sills, Heads, Quoins, Jambs, Fenders, &c.

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Manufacturers of
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96, Renfield Street.

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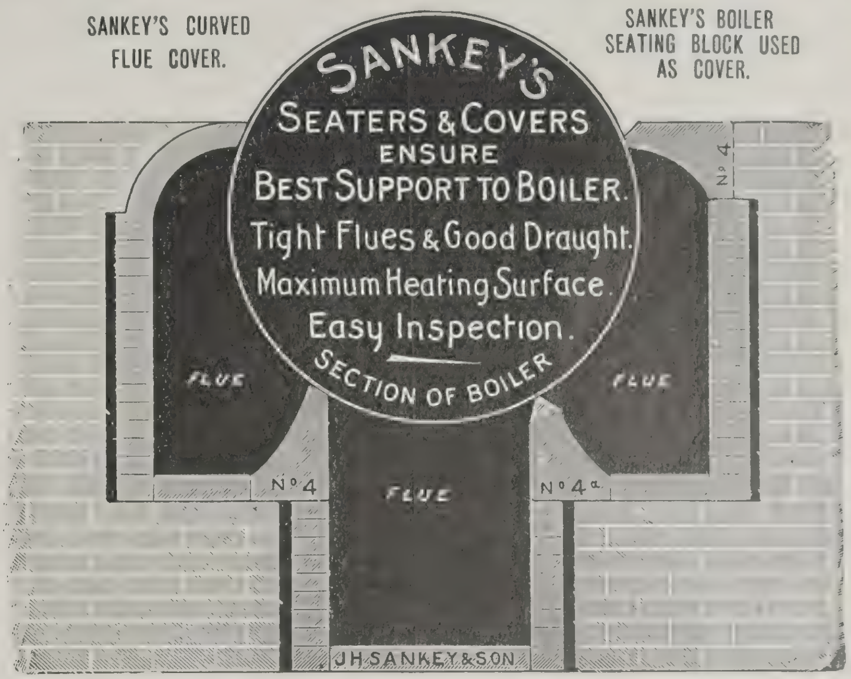

N.B.—These Seaters and Covers meet the requirements of the largest Boiler Insurance Companies, and are the best quality and value.

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Contractors to H.M. Government.
Write for New Catalogues.

B. WARD & Co., Ltd.
38 & 39, PARLIAMENT STREET, WESTMINSTER, S.W.
Concrete, Mosaic, and Wood Block Paving Specialists.
(*See displayed Advt. in issue for March 22, p. ii.*)

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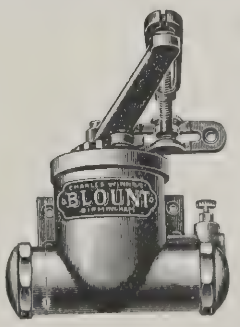

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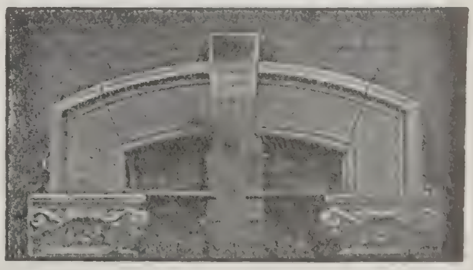

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Price £1. Window Heads, from 5s.

WALWYN T. CHAPMAN,
***Terra Cotta Works,* CLEETHORPES.**

TENDERS—*cont. from p.* xviii.

Hatfield.—For the erection of a new residence at Hatfield, for Dr. P. Morgan Brittain. Mr. Henry F. Mence, architect. Quantities by the architect :—

C. Miskin & Sons, St. Albans	£1,700
S. Worboys, Potter's Bar	1,635
Ekins & Co., Hatfield	1,580
E. Dunham, St. Albans	1,573
W. Saint, Cambridge	1,536
Boff Brothers, Park Street, near St. Albans	1,514
Vail & Williamson,* St. Albans	1,413

* Accepted.

Harpenden.—For making sundry alterations and additions in the erection of a new post-office and shop in High Street, for Mr. A. F. Willmott. Mr Henry F. Mence, architect, Town Hall Chambers, St. Albans :—

E. Dunham, St. Albans	£890
H. Salisbury & Son, Harpenden	840
J. Jarvis & Sons,* London	849

* Accepted.

London, S.W.—For improvements at Larkhall Lane Schools, Clapham, for the Education Committee of the London County Council :—

W. J. Mitchell & Son, Dulwich	£15,798
Lathey Brothers, Battersea Park	15,519
W. Smith & Son, Kennington	15,074
Spencer, Santo & Co., Ltd., Westminster	14,988
J. & C. Bowyer, Upper Norwood	14,974
W. King & Son, Westminster	14,800
Holloway Brothers (London), Ltd.	14,766
J. Carmichael, Wandsworth	14,681
J. Marsland & Sons, Walworth	14,579
J. & M. Patrick, Wandsworth	14,551
J. Simpson & Son, 48, Paddington Street	14,545
F. & H. F. Higgs, Herne Hill	14,458
W. Downs, Walworth Road	14,456
J. Garrett & Son, 17, Balham Hill	14,383
Stimpson & Co., Battersea	14,300
J. Smith & Sons, Ltd., South Norwood	14,250
Holliday & Greenwood, Ltd., Brixton	14,078
J. Appleby & Sons, Lambeth	13,700
Hudson Brothers, Clapham Junction	13,609
W. Johnson & Co.,* Ltd., Bellevue Road, Wandsworth Common	13,205

[Architect's estimate, £14,494.]
* Recommended for acceptance.

London, S.E.—For the erection of stables on their Greenmore Wharf at Bankside, for the Southwark Borough Council. Mr. Arthur Harrison, borough engineer :—

Johnson & Co., Southwark Bridge Road	£6,690
R. & F. Evans, Peckham	6,417
C. Ford & Co., Willesden Junction	6,374
Burman & Sons, Kennington	6,290
Hoare & Son, Blackfriars Road	5,982
Marsland & Sons, Walworth	5,979
W. Renshaw, Putney	5,891
W. Wallis, Balham	5,884
Wisdom Brothers, Isleworth	5,870
G. Neal, Kilburn	5,856
Holliday & Greenwood, Brixton	5,816
G. Parker, Peckham	5,790
F. & H. F. Higgs,* Herne Hill	5,790
L. M. Coles, Plymouth	5,594

* Accepted.

London, W.C.—For rebuilding 171, Strand, for Messrs. Salmon & Gluckstein. Messrs. Thomson & Pomeroy, architects, 49, Hill Road, Wimbledon :—

Imperial Tobacco Co. Works Department	£5,968	10	0
Howard & Co.	5,300	0	0
Holloway Brothers, Ltd.	5,200	0	0
W. H. Lorden & Son	5,089	0	0
Carmichael & Co.	5,078	0	0
Higgs & Hill	4,984	0	0
Perry Brothers	4,857	0	0
T. Holloway*	4,559	0	0
Patman & Fotheringham	4,553	0	0

* Accepted. [To be completed in 25 weeks.]

Newburgh.—Accepted for the erection of new U.F. church. Messrs. Thoms & Wilkie, architects, 46, Reform Street, Dundee :—

A. & T. Craig, Dundee, mason	£1,253	0	0
D. S. & J. Anderson, Perth, joiner	531	8	0
D. Brown, Dundee, plumber	125	0	0
J. Storrier, Newport-on-Tay, slater	120	0	0
A. Beveridge, Newburgh, plasterer	81	15	8

Nottingham.—For the erection of four residences (two with sale shops) in Colwick Road and Meadow Lane. Mr. H. Allcock, architect, Nottingham :—

F. Messon	£1,825	0	0
J. H. Vickers	1,799	10	0
H. Vickers & Son	1,793	0	0
Brooks Brothers	1,789	0	0
J. G. Thomas	1,783	0	0
G. Kerry	1,774	0	0
T. Whittaker	1,750	0	0
F. Wright	1,725	10	3
A. B. Clarke	1,720	0	0
F. Booth	1,714	14	10
J. G. Short	1,697	0	0
G. A. Pillatt	1,661	0	0
T. Barlow	1,660	0	0
W. & J. Simons	1,655	0	0
G. Lovett	1,650	0	0
Richardson & Hewerdine	1,629	10	0
T. Fish & Son*	1,615	0	0
W. Crane, Ltd.	1,598	0	0
J. Wright	1,595	0	0

* Accepted.

Reigate.—For rebuilding coach-builder's premises in Bell Street, for Mr. Frank Burtenshaw. Mr. E. Penfold, architect, High Street, Reigate :—

W. Wickman	£1,528
J. King & Son	1,450
G. Elsey & Sons	1,375
J. Waycott	1,285
A. G. Lovell	1,277
S. Jeal	1,268

Reigate.—For the erection of business premises in West Street, for Messrs. W. Charlwood & Sons. Mr. E. Penfold, architect, High Street, Reigate :—

R. Lee & Son	£2,700
J. Waycott	2,595
G. Cummins & Sons	2,450
G. Elsey & Sons	2,217
J. Hodge & Son	2,214
S. Jeal	2,130
T. Nightingale	2,129

Reigate.—For additions to the grammar school, for the Governors. Mr. E. Penfold, architect, High Street, Reigate :—

A. B. Wiles	£7,561	0	0
T. Bushby & Son	7,559	0	0
J. King & Son	7,534	0	0
Buckland & Waters	7,480	0	0
J. Longley & Co.	7,398	0	0
G. Cummins & Sons	7,239	0	0
J. Hodge & Son	7,163	0	0
J. J. Pink	6,983	17	2
S. Jeal	6,637	0	0

Sheffield.—For the erection of first portion of workshops, blacksmiths' shop, &c., in Brightside Lane and Station Road, Brightside, for the Midland Manufacturing Co. Messrs. Hall & Fenton, architects, 14, St. James's Row, Sheffield :—

J. Fidler, Ltd., Eckington	£3,516	0	0
R. Charlesworth, Hillsbro'	3,494	12	0
W. O'Niel & Son	3,393	0	0
J. Eshelby & Son	3,385	0	0
J. Mastin & Son	3,359	0	0
B. Powell & Son	3,267	0	0
Ashton & Biggin, Ltd.	3,220	0	0
Hollingworth & Bedford	3,212	2	7
Martin & Hughes	3,180	0	0
G. Carr, Grimesthorpe	3,165	0	0
J. White & Son	3,150	0	0
W. W. Mears	3,150	0	0
H. Brumby & Son, Highfield	3,140	0	0
H. Freckingham, Wicker	3,125	0	0
T. Wilkinson & Son, Heeley	3,083	0	0
T. Margerrison, Dronfield	3,050	0	0
H. Boot & Son,* 152, Moore Street	3,030	0	0
H. White	2,981	0	0

* Accepted. [Rest of Sheffield.]

Sutton (Surrey).—For the construction of a covered service reservoir near How Green, Woodmansterne, for the Sutton District Water Co. Mr. W. Vaux Graham, M.I.C.E., engineer, 5, Queen Anne's Gate, Westminster :—

R. Jones & Son, Sutton	£4,935	0	0
R. H. B. Neal, Ltd., Plymouth	4,723	0	0
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THE

BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

April 5, 1905. Vol. 21, No. 530.

6, Great New Street, Fetter Lane, E.C.

Summary.

The new Waldorf Theatre on Aldwych will seat 1,300 persons. It is a three-tier house. The curved girder of the second circle is built up of sixteen plates and weighs 21 tons. (Page 172.)

The largest reinforced concrete arch bridge is the Gruenwald Bridge over the Isar, near Munich. It has two main spans of 230ft. each, with a rise of 42ft., and five girder spans of 28ft. each. It has been designed for a live load of 82 lbs. per sq. ft. and a 22-ton steam roller. (Page 181.)

About 150 manufacturers of galvanized roofing sheets met last week in London and discussed proposals for combination to prevent over-production and to regulate the market: and as the outcome a combine has been effected and prices have been raised. The industry has been far from satisfactory for a long time past. (Page 181.)

In the huge water-supply undertaking for Coolgardie, Western Australia, a locking-bar pipe is used which is cheaper than welded pipe and (strength for strength) than riveted pipe. It has a protective coating of asphalt and coal-tar. (Page 173.)

The maximum weight of crowds is given as 150 lbs. to 160 lbs. per sq. ft. Experiments with students showed that 156 lbs. per sq. ft. was attainable without any attempt at selecting the men or crowding them to any degree of personal discomfort; and though 150 lbs. per sq. ft. can be reached only rarely, 80 lbs. or 100 lbs. per sq. ft. must be realized far more often than is commonly supposed. (Page 178.)

At the meeting of the R.I.B.A. on Monday evening Prof. Beresford Pite and Mr. J. W. Simpson read papers on the planning of cities and public places. There is no reason, either practical or artistic, why our streets should have monotonous parallel sides. A varying line is picturesque and advantageous to the buildings, and affords exactly those spaces for the cab-stands, telephone and fire-escape kiosks, and other constantly increasing requirements which are difficult to provide for and cause obstructions in uniformly regular streets. (Page 180.)

Particulars of building stones are wanted by the Architectural Association. (Page 182.)

St. Mark's, Venice, is in a graver condition than was supposed. The weakest points are the "Paradise" and "Apocalypse" vaults. (Page 182.)

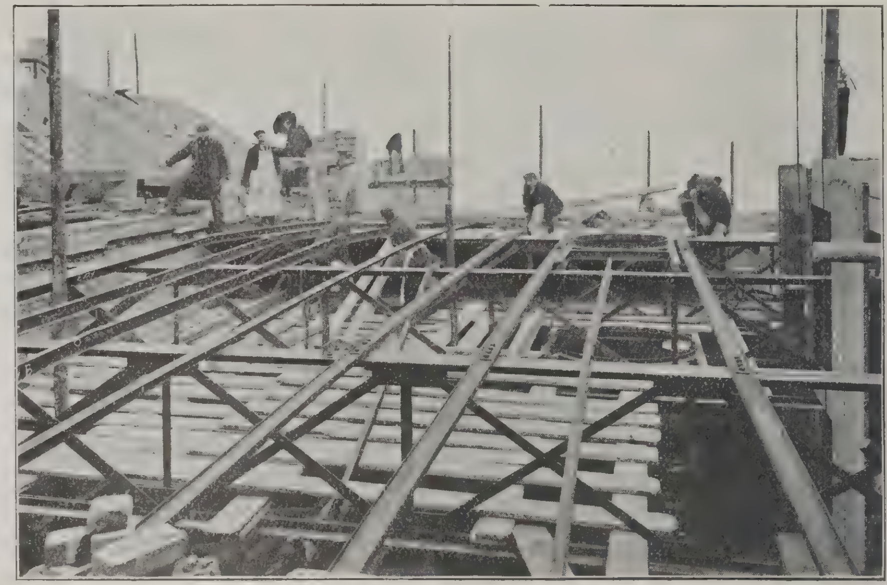
Floors for Hospitals. With the exception of operating theatres, which are almost invariably floored with terrazzo, it is generally the rule to use teak or other hardwood blocks for the wards of hospitals. Opinions differ on the matter, however, and it is recognized that wood is not faultless: hence the introduction in recent years of various kinds of composition flooring applicable to any surface. In this particular connection we may draw attention to a communication addressed to the Commercial Intelligence Branch of the Board of Trade by the British Vice-Consul at Belgrade (the Hon. W. G. Thesiger, D.S.O.) in regard to the flooring for the wards and passages at the new military hospitals now being erected at Belgrade. Wood is held to be undesirable, as not being sufficiently easily cleaned, and linoleum is considered not lasting enough. Some sort of flooring is required which shall have the properties of being antiseptic, easily cleaned and very durable. The matter is of special interest to manufacturers who have any patent flooring which fulfils these conditions. Communications should be addressed to the British Vice-Consul, Belgrade.

Yet Another Building Act Bill. The practically unanimous opposition to the Building Acts Amendment Bill forced the London County Council to drop the general clauses, about which there was most contention, and to proceed this session with the clauses relating to means of escape from fire only. It is now proposed to try again next year, the Building Act Committee recommending: "That with a view to the introduction in the session of 1906 of a Bill to amend the London Building Acts, copies of the document prepared by the Parliamentary Committee showing the effect of the London Building Acts (Amendment) Bill, 1905, on the existing Acts be sent to the Corporation of the City of London, the councils of the metropolitan boroughs, and the various professional and other bodies concerned, with an intimation that the Council would be glad to be acquainted before June 10th, 1905, with any observations which they may make on the suggested amendments to the London Building Acts, and that a copy of a memorandum on the subject to be prepared by the chairman of the Building Act Committee be sent to each member of the various bodies referred to." This seems to suggest that the London County Council intend to adopt not quite such an independent attitude as hitherto, and that they desire to minimize opposition by compromise. It is important that the present Acts should be revised, and we consider the Council will be well advised not to wait longer than next year. We hope no half measures will be attempted, but that the old Acts will be repealed and a comprehensive new Act brought in, because the present Acts and amendments are quite confusing enough to professional men; a building ordinance should be business-like in form. Hitherto the suggestions of professional bodies have been treated with scant courtesy. After receiving suggestions the Building Act Committee should send their altered clauses for further suggestions, and not try and rush through a Bill in defiance of all interested bodies.

Ca' canny in the Country. On Saturday last at the Guildhall there was a conference on housing and small holdings in Surrey, Hampshire and West Sussex, and Sir William Chance then took occasion to ascribe the reason for the dearth of cottages to the working man not doing so much work as he formerly did. He said there was a kind of idea among the working classes that the longer they took to carry out their work the more work there would be for others to do, though he believed the quicker they did their work and built the cottages the more work there would be to do; and he added that a number of people would be glad to have cottages built if it were not for the fact that the work was done so slowly. This is not the first occasion on which the same argument has been advanced. We hold no brief for the working man, but this is not the primary cause of the rise in cost, which is traceable to the by-laws and increased wages. "Ca' canny" as an accepted principle does not exist in country districts, but the natural instinct of self-interest does, and always has. By this we mean that with precarious employment, such as must inevitably exist in the building trades, when a man is in a job he lasts it out as long as he possibly can, because he does not know how long he may be out of another. In the building of cottages in the country we have always urged the adoption of the piecework system. As soon as time-work is introduced open competition goes. Piecework is not against the interests of the working man. It only ensures fair conditions and that the better-trained and more sober man gets the better wage.

THE WALDORF THEATRE.

WE publish this week several photographs of the new Waldorf Theatre which is now rapidly approaching completion on Aldwych—the crescent of the Holborn to Strand street. Mr. W. G. R. Sprague is the architect. The photographs, specially taken by us, show the building in various stages of construction and illustrate the erection of the more usual type of theatre. It is a three-tier house, the front of each tier receding from the one below, thus securing good sight lines and a better-looking front to the house. The frontage to Aldwych is 70ft. and to Catherine Street 160ft. The stage is of a good size; it has a width of 70ft. and a depth of 40ft. The theatre will seat 1,300 persons, and there is also standing room for another 500 or 600. The main entrance is at the Aldwych corner and leads from a spacious vestibule into a crush-room. The decoration of the interior is now being rapidly completed, the ceiling paintings and gilding, &c., of the mouldings and proscenium arch and gallery front being practically finished; the exterior, too, is almost completed.



CONSTRUCTING ROOF OVER AUDITORIUM. *(January 30th, 1905.)*

The two photographs taken on November 3rd last year show the state of the job at an early stage, when it was only up to the first-tier level. In the large view on p. 174 the two legs of the tower gantry will be noticed and also the steelwork of the first tier. There is nothing very special about this: it is the usual straight girder with the curved front formed by cantilevers projecting beyond. The stays for the fronts will be seen fixed in the left-hand corner. The opening on the right is for an exit staircase. The other view taken on November 3rd is from the auditorium looking towards the stage and shows one side of the proscenium and a stage-box opening. The heavy timbering belongs to the platform used for taking the steelwork, which was brought in from the stage end, and served to allow of its easy moving into position.

The view on page 175, taken from the back of the stage, shows this timber platform and the use to which it was put, the large plate girder of the second tier (referred to below) being visible in the foreground in process of being moved. This photograph also shows the lattice girder supporting the flies, the floors of which have been constructed in concrete so as to resist fire.

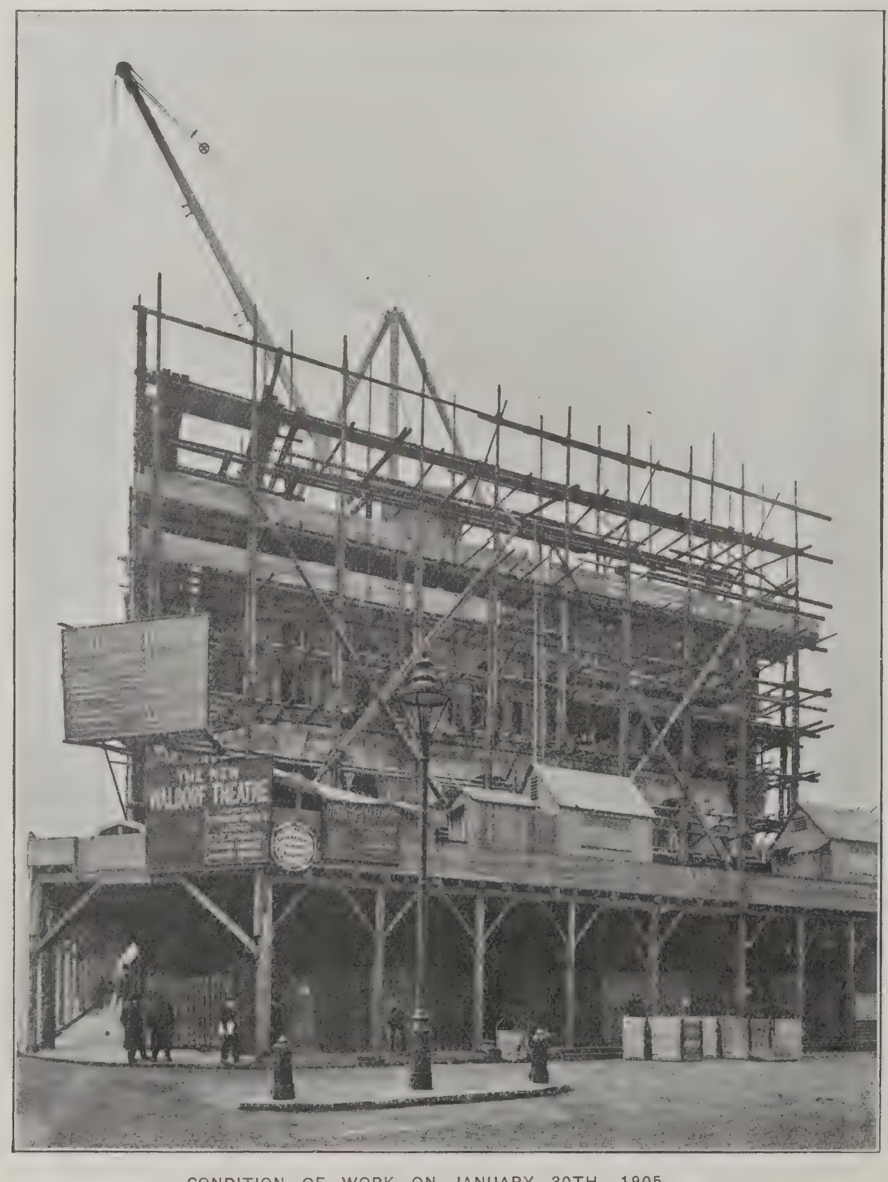
The views taken on January 30th last show that considerable progress had been made by that date. The crane seen in the general view is the one which broke recently, with such alarming (though happily not fatal) results. The view of the roof over the auditorium shows the proscenium wall on the left and the skylight over the stage. The third view (on p. 174) shows the underside of the second or grand-circle tier and clearly illustrates the cantilever construction. The curved girder is a very heavy one. It weighs 21 tons and has sixteen plates; its shallow depth will be noted; it is only 16ins. deep in the centre and tapers to 2ins. at the ends.

The steel construction was designed, supplied and fixed complete by Messrs. Smith, Walker & Co., of 37, Old Queen Street, Westminster, who make a special feature of prompt delivery, the steelwork for this theatre having been completed two days before the expiration of contract time, and this in spite of the fact that the dates for completion were brought forward from the original contract time. No columns or stanchions whatever are in the way of the sight lines. The ceilings, too, preserve an unbroken sweep, no girders or raking joists projecting beyond the ceiling line and making obstructions to the clear view of the stage.

The general view taken on March 8th shows the front nearly finished. The crane which broke was not re-erected and therefore is not to be seen in this view. The other photograph on this date (see p. 176) was taken from the back of the stage and shows the scaffolding in the auditorium and two of the tiers. The light spots here and there are caused by the electric lamps used to illuminate the work.

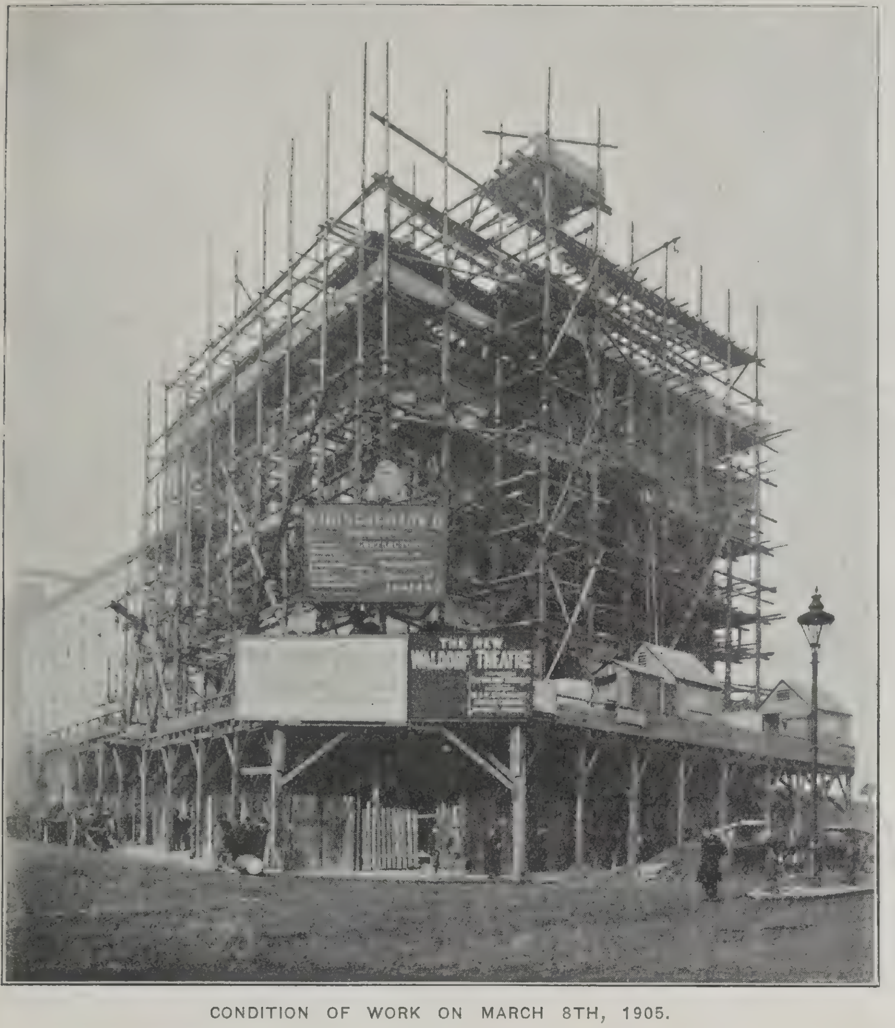
The general view on March 29th brings our record up-to-date.

In a second article we shall deal with the building further, showing it complete.

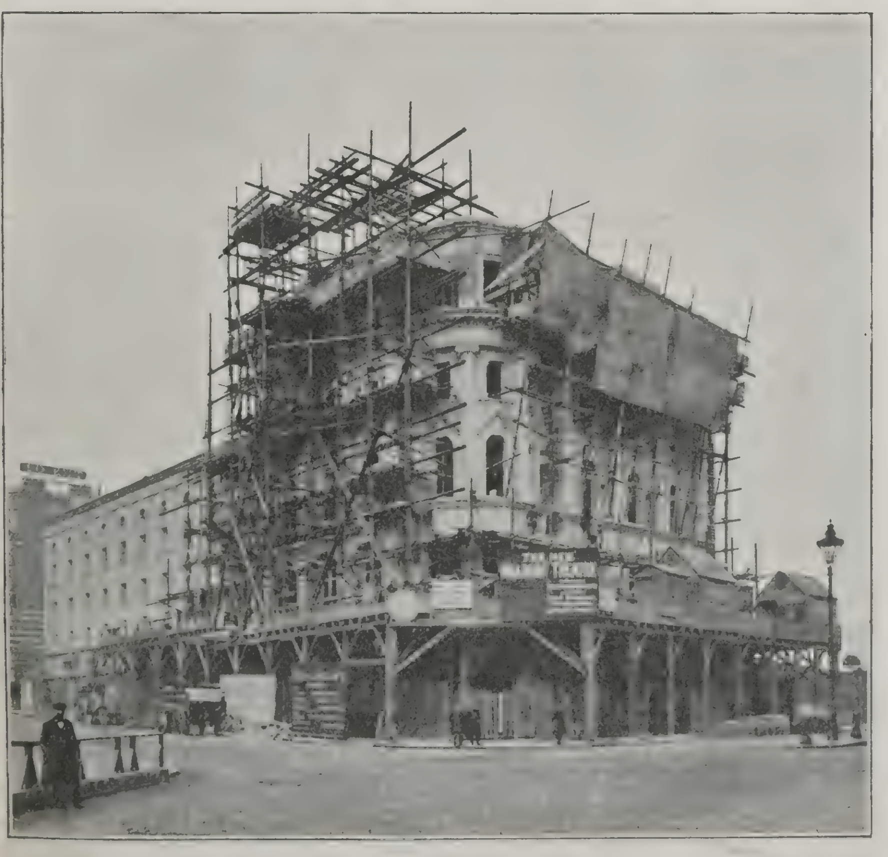


CONDITION OF WORK ON JANUARY 30TH 1905.

A Spire to St. Stephen's, East Twickenham, is to be erected in memory of the late vicar, Prebendary Johnston.



CONDITION OF WORK ON MARCH 8TH, 1905.



.CONDITION OF WORK ON MARCH 29TH 1905.

A NOTABLE WATER-SUPPLY UNDERTAKING.

AT last week's meeting of the Institution of Civil Engineers a paper on the Coolgardie water-supply was read by Mr. C. S. R. Palmer, M.I.C.E. Coolgardie is situated in the interior of Western Australia, where the country is exceedingly arid, fresh water being unobtainable naturally. Large expenditure was first incurred on small local water-supply works, but without commensurate results, and the Government decided on a comprehensive scheme of construction. After enquiry into alternatives, it was recommended that the work should consist of a storage-reservoir in the Darling ranges (capacity 4,600 million gallons, enough for two years' supply and loss), a 30in. pipe to carry thence five million gallons daily, a series of pumping-stations along the pipeline, and service reservoirs at various centres; the estimated cost of these works being £2,500,000. Parliament having approved the project and provided funds, an English commission of engineers was appointed to report on the proposals and advise on the design of the pipes, &c. Work was started soon after receipt of their report, and five years later, in January, 1903, the works were formally opened.

The English commissioners recommended that three-fourths of the pipes should be riveted and one-fourth welded, that expansion-joints should be used, and the pipes be laid above ground. Tenders were invited accordingly, but permitting of alternative offers, and in the result a new form of pipe—the locking-bar pipe—was accepted, being cheaper than welded pipe and, strength for strength, than riveted pipe. The saving on the estimate enabled thicker pipes to be used, and, the danger of undetected leakage from riveted pipes being removed, the main was laid below ground with ordinary lead joints. The protective coating consisted of 1 part of asphalt and 1 part of coal-tar.

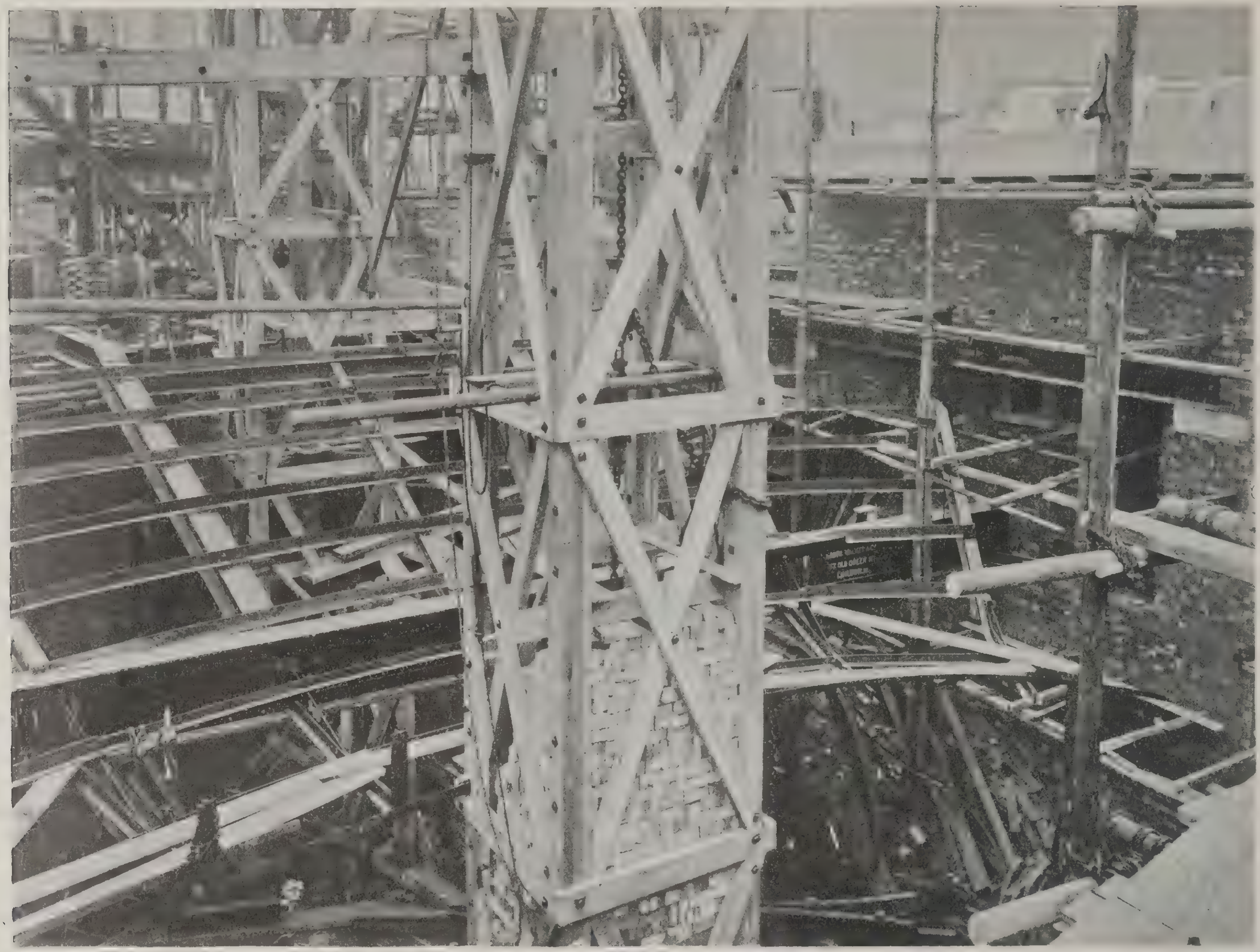
Obituary.

Mr. Joseph Ives, for many years associated with the firm of contractors Messrs. William Ives & Co., of Shipley, died recently. Among other works erected by the firm was Bradford Town Hall.

Mr. S. J. Nicholl, A.R.I.B.A., died on March 21st, aged 78. He was a Roman Catholic architect. Among many works carried out from his designs may be mentioned the Church of Our Lady of the Sacred Heart, Wellingborough, and the Church of St. John the Baptist, Brighton.

Mr. T. Denville Barry, architect, of Liverpool, died recently, in his ninetieth year. He was a native of Cork, was once city surveyor of Norwich, and afterwards practised extensively in Liverpool. He was the architect of the Unitarian Church in Hope Street, Liverpool, St. Peter's Church, Birkdale, and St. Andrew's Church, Southport.

Mr. George Henderson, of the firm of Hay & Henderson, architects, Edinburgh, died recently. In partnership with the late Mr. William Hay, he was engaged in various important building operations, including the restoration of St. Giles' Cathedral. He also acted for some years as architect to St. Mary's Cathedral, Edinburgh. He designed numerous mansions, including additions to The Hirsel, Douglas Castle, Bowland House and Colliston Castle. At Galashiels he built St. Paul's parish church and the free library. The fine parish church at Distington, in Cumberland, with the schools adjoining, was also his work. Mr. Henderson was employed for buildings of importance in Canada and other colonies. The cathedral at Bermuda, now nearly finished, was designed by him.



WALDORF THEATRE, ALDWYCH, LONDON: STEELWORK OF FIRST TIER. *(November 3rd, 1904.)*

Views and Reviews.

The Law of Easements.

The author of this book on a dull subject has aimed solely at giving a clear and accurate outline of the law, and has confined himself to easements properly so called, though in his third chapter he has been compelled to deal at some length with natural rights of property. The book is printed in big type, with bold side-heads, and has a good index. It appeals to architects as well as to law students.

"An Epitome of the Law relating to Easements," by T. J. Blyth. London: Sweet & Maxwell, Ltd., 3, Chancery Lane, W.C., price 6s.

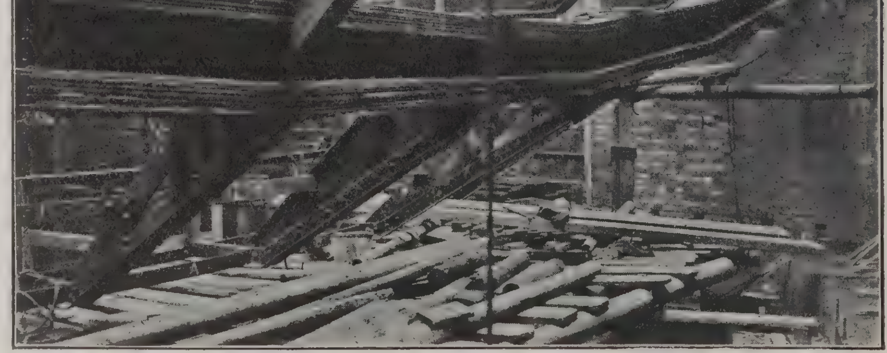
Gas Producers.

It is not long since we had the author's handbook on gas- and oil-engines before us, and this present manual may be regarded as a companion to it. The book is specially addressed to purchasers of power-producing machinery as well as to erectors and attendants. It is put together in a very practical form, and has numerous illustrations. Gas as a source of power has undoubtedly a great future, and it is useful therefore to have presented in a handy form a succinct description of the chief forms of suction plant offered by leading makers.

"Gas Producers for Power Purposes," by W. A. Tookey. London: Percival Marshall & Co., 26-29, Poppin's Court, Fleet Street, price 1s. nett.

A Fifth Edition of Fletcher's "History of Architecture."

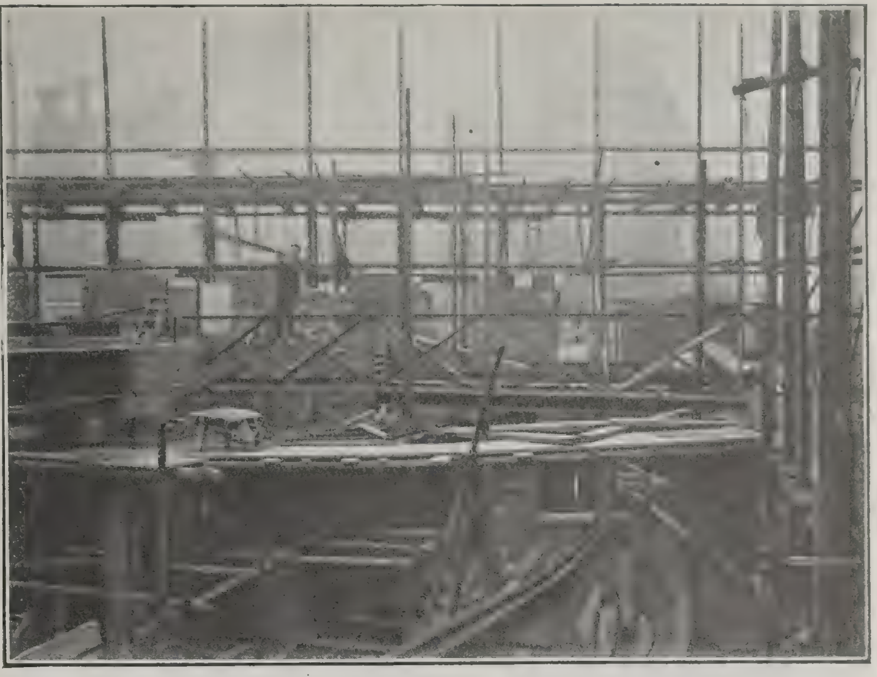
With the fifth edition Banister Fletcher's "History of Architecture" has undergone very extensive revision. Indeed, it has been largely rewritten. The illustrations have been increased by the addition of about 700, bringing the total number up to about 2,000, while many of the subjects shown in previous editions have been redrawn and corrected in the light of more recent discoveries. This present edition is a material advance on former ones. The compression of the text is an improvement, but the defects we referred to in our review of the fourth edition (in our issue for February 5th, 1902), although in part remedied, are still very apparent. We are glad to see that Mr. Fletcher has extended Part II. of the work, treating of what he calls "the non-historical styles," under which division he places Indian, Chinese or Japanese, Ancient American and Saracenic architectures. The illustrations to this part are instructive, as also the notes descriptive of them; but the author's general remarks leave the student very much at sea, and we are almost inclined to think it would have been better if this section had not been included rather than that it should create such a false impression. On the whole, we must accord praise to the publisher for the manner in which



BACK VIEW OF STEELWORK TO SECOND TIER. *(January 30th, 1905.)*

he has produced the book, and commendation of Mr. Fletcher's industry in collecting facts and illustrations, though we cannot help feeling that the book is too expensive for the students to whom it appeals the most. What is more especially needed in any book on history is a good general introduction of wide grasp discussing the principles of architecture so as to give the student a thoroughly sound bearing.

"A History of Architecture on the Comparative Method for the Student, Craftsman and Amateur," by Prof. Banister Fletcher and Banister F. Fletcher, F.R.I.B.A. London: B. T. Batsford, 94, High Holborn, W.C., price 21s. nett.



ONE OF THE FLY GIRDERS. *(November 23rd, 1904.)*

Measuring and Estimating Builders' Work.

Like others in the same series, these two sixpenny manuals are compiled from the pages of "Building World." They are full of practical information, illustrated by diagrams here and there, and will be found useful to students and workmen.

"Measuring Builders' Work," "Estimating for Builders' Work," edited by Paul N. Hasluck. London: Cassell & Co., price 6d. nett each.

The St. Louis Exhibition Buildings.

In view of the fact that the St. Louis Exhibition is now a thing of the past, and that long ago it was fully dealt with by various publications in this country, this book makes its appearance considerably belated and with much of its interest lost. Omitting those considerations, however, it may be said that the book is well put together, and doubtless will find a limited audience among those for which it is specially intended, namely, organizers, architects and others who may be engaged upon the planning and constructing of future exhibitions. At this time of day there is no occasion to make any criticism of the buildings, and we think it sufficient therefore to thus briefly announce that an English book on the subject has appeared.

"The St. Louis Exhibition, 1904," by H. Phillips Fletcher, F.R.I.B.A. London: B. T. Batsford, 94, High Holborn, W.C., price 5s. nett.

SCAFFOLDING AT STAGE END. *(November 3rd, 1904.)*

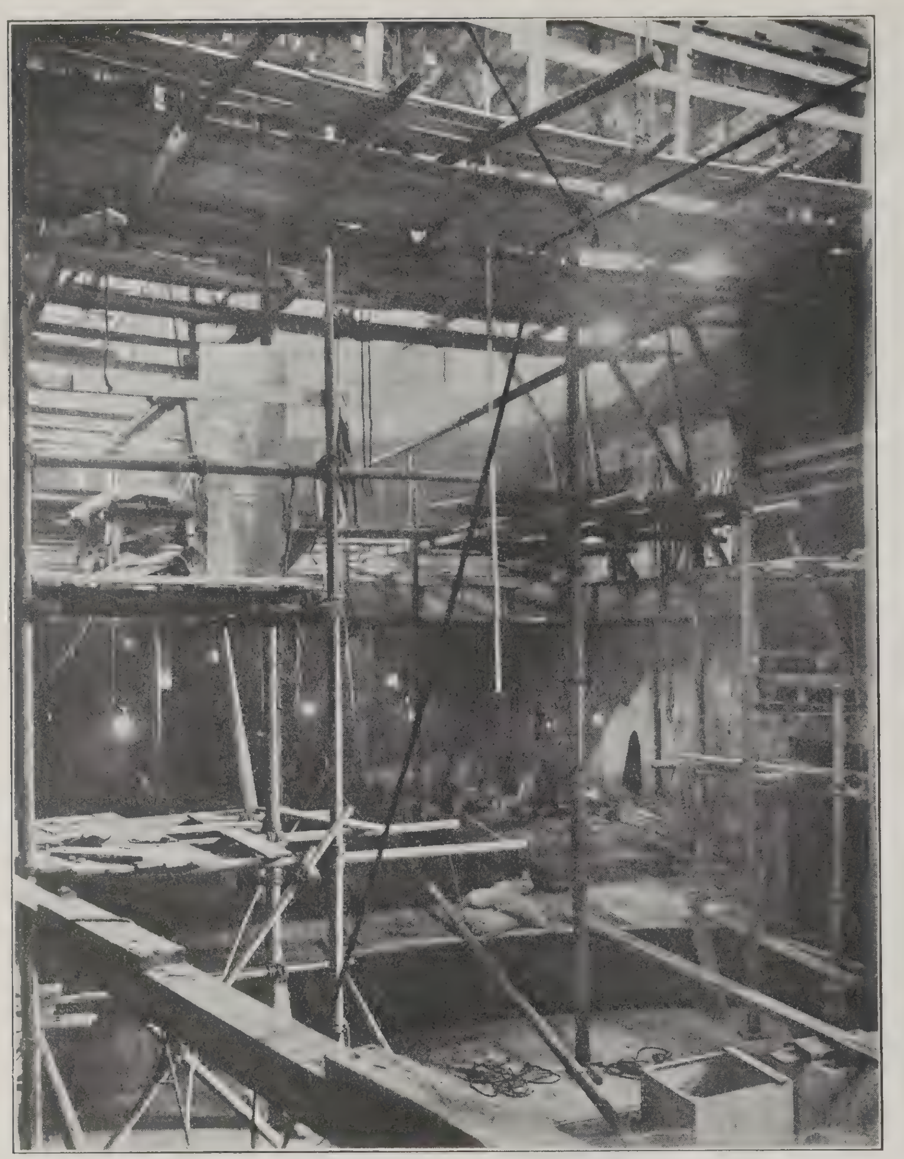
Conduct of Building-Work.

The second edition of Mr. Leaning's small book is a considerable improvement on the first. The London School Board's instructions to clerks of works, the synopsis of regulations adopted by various public bodies, and the rules for the examinations of the Incorporated Clerks of Works' Association of Great Britain have been added to the appendix. The book is very useful and is clearly written and singularly free from verbiage. In a treatise of this character it is difficult to know where to leave off, for in the conduct of building work is embraced the whole subject of construction. Considering the difficulty, Mr. Leaning has performed his task well.

"The Conduct of Building Work and the Duties of a Clerk of Works: A Guide to the Superintendence of Building Operations," by J. Leaning, F.S.I. Second edition, revised and enlarged. London: B. T. Batsford, 94, High Holborn, W.C., price 2s. 6d. nett.

Professor Lanteri is to be the recipient of a presentation by the modelling students at South Kensington, in celebration of his twenty-fifth anniversary as master of the school of sculpture.

The Manufacture of Portland Cement in Russia, while comparatively new, has nevertheless made rapid strides in the past few years. The industry was practically unknown ten years ago, at which time the annual output was not more than 300,000 barrels (equal to about 50,000 tons), and this was mainly the output of one company. Some time later other companies began operations, and the demand for cement became very much improved. In 1898 eight new companies were organized in the Black Sea district, and the demand steadily grew from 400,000 barrels in 1896 to 1,000,000 in 1899. This was further increased in 1901 to 1,500,000 barrels. Despite the ever-increasing demand, the production was greatly in excess of the consumption, however, and prices began to decline very rapidly. This state of affairs was fatal to a number of the older companies, some of which were compelled to close down their plants. In 1901 the production was almost half as much again as the demand—the production being 2,950,000 barrels and the consumption 1,550,000.



WALDORF THEATRE, ALDWYCH, LONDON: VIEW LOOKING FROM STAGE INTO AUDITORIUM.
(March, 8th 1905.)

Electrical Notes.

The Simplex Pocket List for 1905 is a neat little booklet giving particulars and illustrations of the multitudinous fittings for the system of electric wiring adopted by the Simplex Steel Conduit Co., Ltd, of Birmingham, London, Manchester, Liverpool and Glasgow.

The Brockie Pell Arc Lamp Works in Worship Street, London, were visited recently by the Junior Institution of Engineers. In the workshops a number of lamps of different types were shown in course of manufacture, and in the testing-room demonstrations were carried out to illustrate the effect on the arc of two methods of regulation, namely, differential (main coil and shunt coil working in opposition) and shunt coil only, the result being that with the shunt coil alone the current might be varied very considerably without affecting the length of the arc, whereas with the differential method the variation in length of the arc was very considerable with the same change in the current strength. The two lamps were run in series so that each had the same current passing through it.

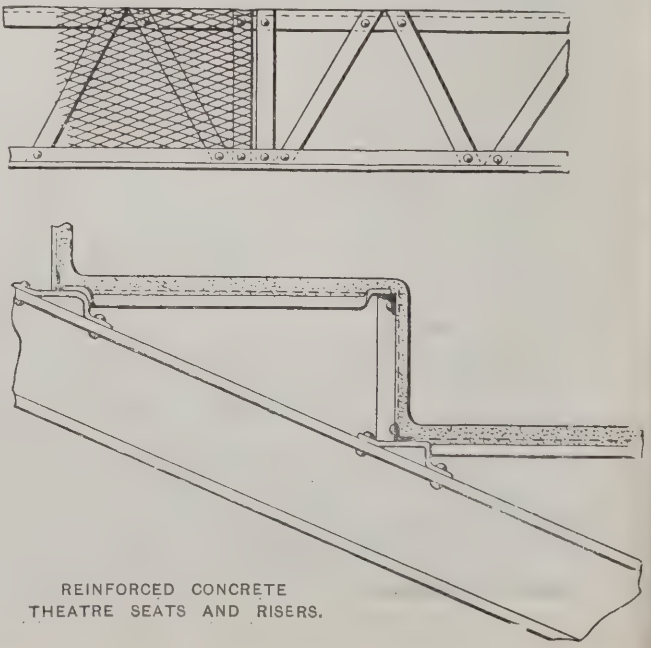
Belfast Corporation Electricity Supply.—In view of the electrification of the Belfast tramway system, now being carried out, large extensions are being made at the Corporation generating station. With a view to assisting small power users, a system of letting out motors on hire has been instituted and this has been largely availed of. The system of supply in Belfast is the three-wire low tension system at 220 and 440 volts. All the generators are arranged so that they can work as shunt machines on the lighting supply or as compound machines on a traction supply. About forty miles of streets are being equipped electrically. Mr. H. A. Cutler, city surveyor, is responsible for the track work; Mr. A. Nance, tramways manager, for the cars and car depôts; and Mr. V. A. H. M'Cowan, city electrical engineer, for the overhead electrical equipment, the feeder-cable system and the power supply. The contract has been placed with Messrs. J. G. White & Co.

Efficiency of Electric Arc Lamps.—In the course of a paper on "The Flux of Light from the Electric Arc with Varying Power Supply," which he read before the Physical Society recently, Mr. G. B. Dyke gave the results of observations made to obtain a series of curves for both continuous and alternating current arcs showing the relation between the mean spherical candle-power and the watts taken up in the arc, and to compare efficiencies. It was found from the curves obtained that for each arc length the point at which the efficiency curve cuts the axis of watts is the same whether the arc is supplied with continuous or alternating currents. For lengths greater than ⅛in. the ratio of the efficiencies of the two arcs is about 3 to 2; but if the arc remains shorter the efficiency line for the alternating-current arc is found to gradually approach the line for the continuous-current arc until for an arc length of 3/32in. they are practically coincident. Any further decrease in the arc length will result in the alternating-current efficiency line rising above the continuous-current line, and Mr. Dyke believes that this is the first case in which this greater efficiency of an alternating-current arc has been realized in practice. Within the limits of experimental error the relation between mean spherical candle-power and watts follows a straight-line law.

Firing Blasts by Electricity possesses the advantages of safety, speed and certainty. In many positions the absence of smoke from the burning fuse is no small advantage, and where blasting operations have to be conducted in crowded cities, or in close proximity to traffic, the most favourable moment for firing can be chosen, and there is not the fear that someone may approach the blast while the fuse is burning.

THEATRE SEATS.

WHILE illustrating the erection of the Waldorf Theatre it is opportune to publish the accompanying illustration of a minor but important detail in theatre design, namely, the method of forming seats and risers. This detail gives suggestions for buildings having a somewhat similar purpose, *i.e.*, housing a considerable audience, such as churches, lecture- and class-rooms, concert halls, &c. The risers are formed of lattice girders, curved on plan, fixed on stools carried by the radial cantilevers. Flat wrought-iron bearing bars spaced at 1ft. centres, half twisted at both ends so as to span the intervening space on edge, extend from the top angle of one lattice girder to the bottom angle of the next. Expanded metal lathing is wired to these bars and to the members of the lattice girders and covered with 2½ins. of concrete to form the seats or treads, and with 1½ins. of cement plaster to form the risers. The seats and risers at the Royal York Theatre of Varieties, Southampton, the Ealing Theatre, the New Olympia, London, the Alhambra, Blackpool, Paisley Theatre, &c., are all on this system.



REINFORCED CONCRETE
THEATRE SEATS AND RISERS.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

Steel-frame Buildings.

MANCHESTER.—H. G. writes: "(1) What advantage is there in adopting the American steel-frame form of building when the authority makes you put the walls of ample thickness to carry all the weights required? To my mind the only advantage in such construction is saving of space, which you do not get under the above circumstances. (2) Can you inform me of the most up-to-date and simple tables for an architect giving weights, strengths, &c., of materials?"

(1) The illogical insistence by local authorities on the same thickness of walls with a steel-skeleton construction as without such construction of course limits the advantages of a steel frame, but in many cases the saving of space and the rapidity of erection obtained by this system (and the consequent shortening of time during which capital must remain locked up without interest) warrants its employment. (2) We do not know of any combined tables giving what you ask, but you will find the information in a convenient form in "Specification No. 8," price 2s. 6d. (or 3s. 3d. post free) from our offices.

Damp Walls.

BELPER.—T. W. writes: "What do you advise for a damp stone wall with brick lining? I believe there is no damp-course. Would 'Adamant' or 'Stukalite' plaster prevent damp if substituted for existing ordinary plaster, and could the same be papered on at once?"

You cannot prevent damp penetrating a wall by plastering inside, even with Portland cement. You should first investigate whether the damp comes through the wall or rises from the ground. If the former, it can be prevented by cement-plastering, tiling, slating or tarring the outside of the wall; if the latter, a damp-course will need to be inserted, this being done piecemeal with bitumen sheets put in the wall by gradually removing bricks or by cutting through the wall with a strong two-handled saw. If this is found impossible of execution, dry areas should be created or asphalt applied vertically to the portion of the wall below ground both internally and externally.

Sketching at Haddon Hall.

BIRMINGHAM.—GOTHIC writes: "What is worth measuring in the neighbourhood of Matlock, Derbyshire? To whom must I apply for the necessary permission to measure at Haddon Hall?"

Almost everything is worth sketching at Haddon Hall. It would be very difficult to recommend a particular choice of subject without some knowledge of a student's capabilities or special interest. But mention may be made of the screen in the Great Hall, the Jacobean woodwook in the chapel, and the elaborate wainscoting in the Long Gallery. Bakewell Church was very largely rebuilt about 1842, but the west end, chancel and south porch of the old building remain. There is a Norman doorway at the west end. The Renaissance tombs in the Vernon chapel (south transept) deserve attention, and at the east end of the south aisle the Foljambe monument with the double aumbry over is worth measuring. There is some good modern work in the choir stalls and screen; some of the miserere seats are ancient. I am not well acquainted with Winfield Manor, but you should send 4d. to the "Derbyshire Times" Office, Chesterfield, for a copy of their Winfield Manor guide-book. It contains a very good plan and two full-page illustrations. Youlgreave Church, two miles from Bakewell, is worth a visit. There is some good Norman work there, and a fine fifteenth-century tower. The church was restored by Norman Shaw. The key is kept at the post-office. The Peacock Inn, Rowsley (1652), and the old hall at Bakewell (1686), are picturesque houses. There is usually no difficulty in obtaining permission to measure and sketch at Haddon. A uniform charge of 4d. is made for each visitor to the Hall. Permission to sketch inside should be asked of the custodian, Mr. J. Eades, at the cottage adjoining the hall. To prevent a possible disappointment, a letter addressed to him at Haddon Hall, Bakewell, might be of service. See an article in the BUILDERS' JOURNAL for August 14th, 1901, "In the Vicinity of Haddon." An architectural guide to Haddon is on sale at the Hall, and for a more popular description there is "A Day in the Peak," a very good local guide-book, which deals with Bakewell Church, Haddon and Chatsworth (C. E. Wardley, publisher, Buxton, price 6d.).

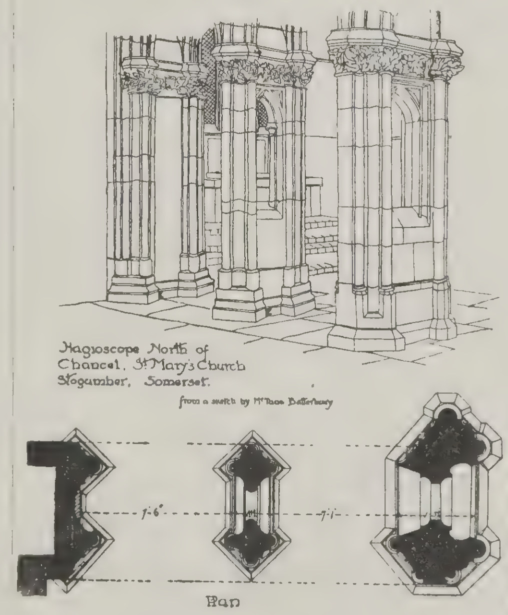
F. H. C.

Hagioscope at Stogumber Church.

DEVONPORT writes: "Having read an account of a church at Stogumber, Somerset, having the double hagioscope pierced through the spandrel of the arches (I believe the building is Norman), I shall be glad if you will explain the meaning of the above?"

The hagioscope or squinch at Stogumber occurs not only in the pier of the chancel arch but also in that which separates the two arches between the chancel and the north chancel aisle. Thus it can hardly be called a double hagioscope, but rather two hagioscopes, each contrived so that a different part of the congregation in the aisle may see the elevation of the Host and participate in the Mass. The whole, as will be seen by the accompanying sketch, is of late date—quite the end of the fifteenth, if not of the sixteenth century.

G. A. T. M.


Hagioscope North of Chancel, St Mary's Church Stogumber, Somerset.

from a sketch by Mr Thos Batterbury

Stopping-up Worm Holes and removing Discoloration.

CHESTER.—J. M. & S. write: "What preparation is most efficient for taking discolorations out of American white oak, plain and figured; also for stopping-up worm holes in same? The oak in question is to be used for internal seating, and will not be varnished."

For stopping-up worm holes you can have nothing better than a putty made with half whiting and half white lead ground up with raw linseed oil. As to removing discolorations on the oak, that is practically impossible; in fact, it is likely that any liquid agent applied would only cause greater discoloration. For the white wood you cannot do better than brush it over with peroxide of hydrogen. Success, however, cannot be promised always, for bleaching wood is very difficult.

H.

Air-holes in Base of Stanchion.

STRATFORD-ON-AVON.—PEBWORTH writes: "Is there any rule for the size and number of air-holes in the base of a stanchion?"

This query is incomprehensible. I see no reason for putting any air-holes at all in the base of a stanchion. I would regard them as detrimental rather than otherwise.

HENRY ADAMS.

St. Mary's, Redcliffe, Bristol.

LONDON.—SUBSCRIBER writes: "Please give some information about St. Mary's Church, Redcliffe, Bristol."

The middle north porch was commenced in 1292 on the site of a former foundation; in the fourteenth century the tower and grand northern porch were added; and the finishing of the nave, choir and transepts was completed in the fifteenth century. A storm in 1445 destroyed the spire and did much damage to the western end. A full history of the church was written by J. Britton, F.S.A., in his architectural essay relating to Redcliffe Church, Bristol, which will be found in any of the London architectural libraries.

M.

Perpendicular Churches.

LONDON.—F. R. S. writes: "Is there any Perpendicular work suitable to measure for the R.I.B.A. final examination which is in or near a seaside resort, preferably in the North of England? I know of several pieces of excellent Early English work, but have been unable to find any Perpendicular at a seaside resort."

Herne Church, near Herne Bay, is a excellent example of fourteenth- and fifteenth-century work. Birchington, a few miles further west along the coast, also possesses a fifteenth-century church. Other examples will be found at Prittlewell (near Southend), Southwold, Lowestoft, Cromer, and at many places on the Broads. As far as can be ascertained in London, no watering-places further north contain good examples of Perpendicular churches. Colchester, through which you have to pass on your way to Walton, Frinton and Clacton, and the surrounding district, possesses many fine examples of fifteenth-century churches suitable for your purpose, and there are several on the branch line between Colchester and the coast.

G. A. T. M.

Cultivation Tank and Bed for House Sewage.

SHEFFIELD.—X. writes: "Referring to the report on p. 139 of your issue for March 15th, I should be glad if Mr. Turnell would give particulars of a cultivation tank and bed for house sewage."

The cultivation tank should contain not less than three days' sewage from the houses, while the cultivation bed should be of about equal cubic capacity to the tank.

A. E. TURNELL.

Architects' Fees.

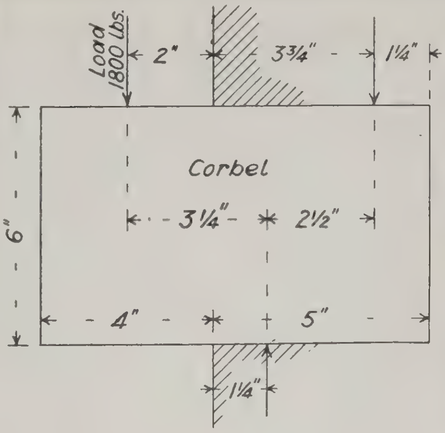
LANCASHIRE. — PERPLEXED ARCHITECT writes: "A mining surveyor's assistant was asked by a friend to prepare plans for a proposed villa to cost about £1,500, and after trying to prepare some sketch plans himself, approached me on the subject and admitted it was beyond him. It was agreed that I should submit several sketches, and eventually one was accepted by his friend, and the surveyor instructed me to prepare the necessary drawings to carry out the work, the verbal arrangement being that we should share equally at the completion of the work. I completed the draft plans and also made fair-copy cloth tracings for the district council's inspection. The plans received the council's approval in due course, the contract was made, and the work proceeded with without the client having been interviewed. During the erection the surveyor obtained the draft plans from me in order that his friend might look at them. These were not returned as promised, and I found on making an inspection of the building during its erection that my plans, which I had signed, had been cut down so as to remove my signature, and the surveyor's had been substituted. The builders who carried out the work informed me that the surveyor seldom came on the site of the works and when asked any questions respecting the construction or details simply replied that they must work to the drawings as near as possible and he would be quite satisfied. The surveyor during the erection of the house gave me a cheque for £2 2s. as a present from himself, and when I asked him some weeks after to return my draft plans I was promptly informed that he had paid for them and that they were now his property. I have copies of the drawings in my possession, also letters from the assistant surveyor instructing me to prepare the plans. Am I entitled to hang these drawings in my office as a specimen of work executed by me? Who is the architect?—for the mining assistant calls himself architect on the strength of having erected the house."

As you did not superintend the erection of the building you are only entitled to payment according to the schedule of the Royal Institute of British Architects. The letters you possess apparently only contain instructions, and do not define the terms on which you undertook the work, and, therefore, as it is a question of one man's word against another's, you must be careful of your actions. There is nothing illegal in a man posing as an architect, and if you go out of your way to damage his reputation you lay yourself open to prosecution for slander or libel. You can bring the case into court if he refuses to pay your fees, or if you have suffered damage in any way, but the latter would be difficult to prove in the circumstances, and we should not advise this course. You cannot insist on your plans being returned without you forego your fees, as in the present state of the law they belong to the client on payment. You ought to have objected before and insisted on your plans being returned, if necessary suing for an injunction to prevent the erection of the building according to your plans without your supervision, on the grounds of detriment to your reputation and affecting your responsibility. We think you would be entitled to exhibit the plans as a specimen of your designing.

Strength of Stone Corbel.

Ealing.—One in Doubt writes: "Referring to the reply on p. 132 of your issue for March 8th, I should be glad if you would explain in $\frac{1800 \times 2}{3{\cdot}75}$ how the 3·75 is obtained."

The 3·75 is the distance from the face of the wall to the centre of the back half of corbel. In the second case taken in the calculation of strength on p. 132 it would perhaps be more correct to assume the condition of the accompanying figure, taking the leverages as $3\frac{1}{4}$ins. and $2\frac{1}{2}$ins. on either side of the reaction. Then $\frac{1800 \times 3\frac{1}{4}}{2\frac{1}{2}} = 2{,}340$ lbs. upward thrust, and $1{,}800 + 2340 = 4{,}140$ lbs. downward pressure on a surface $6 \times 2\frac{1}{2} = 15$ sq. ins., and $\frac{4140 \times 144}{15 \times 2240} = 17{\cdot}5$ tons per sq. ft. The safe load on brickwork in mortar being taken at 4 tons per ft. super., the carrying power of the corbel will be reduced to $\frac{4}{17{\cdot}5} \times 1800 = 411$ lbs., or, say, not more than $7\frac{1}{2}$ cwts. on the whole girder, unless the corbels are built further into the wall.



HENRY ADAMS.

LIVE AND DEAD LOADS IN BUILDINGS.

By C. C. SCHNEIDER, M.Am.Soc.C.E.

(Concluded from p. 168, No. 529.)

In the discussion which followed the reading of Mr. Schneider's paper Mr. J. K. Freitag, Assoc.M.Am.Soc.C.E., said:—

As regards the floor loads suggested, I heartily agree with the proposed live load of 40 lbs. per sq. ft. for ordinary cases. The small live loads which have been found by such experiments as those conducted by Mr. E. C. Schankland and by Messrs. Blackall & Everett, ranging from 12 to 16 or 17 lbs. per sq. ft., have tempted in some cases the use of unit loads as low as 20 lbs. per sq. ft., but such recommendations should certainly be questioned and even heartily condemned in conservative practice.

Provision for Excess Loading.

While 20 lbs. per sq. ft. may be sufficient for average present loads in office buildings, &c., it is to be remembered that the use of an average is always dangerous, while provision should be made properly, but not extravagantly, for all possibilities of excess, either present or future. The character of a building's contents or usage is subject to extreme change. The entire building, or possibly only portions thereof, may be devoted to very different uses from those primarily assumed, so that, in spite of the provisions in building ordinances against radical change in the character or degree of floor loads, it is often difficult to balance present economy against possible maximum requirements or future possibilities. Here, as well as in the strength of materials, a sufficient factor of safety should always be applied.

Calculations for Floor Beams.

The author proposes to calculate all floor beams for a concentrated load of 5,000 lbs. at any point, this being the approximate weight of the heaviest portable safe which would commonly be used in offices, &c. A safe of this weight would be approximately 4ft. wide by 3ft. deep. The factor of safety assumed in the calculations of the floor beams as recommended in Mr. Schneider's specifications would be about 4. Professor Rankine gives a factor of safety of 4, which would be applicable to a reliable steel-frame structure, while for masonry a factor of safety of 8 is recommended under live loads. Again, on page 361 the same authority states as follows:—

"The factor of safety in structures of stone should not be less than 8, in order to provide for variations in the strength of the material, as well as for other contingencies. In some structures which have stood it is less; but there can be no doubt but these err on the side of boldness."

Floor Arches.

All present types of fireproof floor arches would come under the classification of the poorest kind of masonry, so that, if the floor beams were calculated for a concentrated load of 5,000 lbs., consistency would require an ultimate arch capacity of 40,000 lbs. applied over any bearing area of 12 sq. ft., or 3,333 lbs. per sq. ft. Many, if not most, forms of fireproof floor arches now in general use would fail to develop this strength. In the Denver tests the best end-construction arch sustained a final load of only 15,145 lbs., or 1,670 lbs. per sq. ft. over a loaded area of 9 sq. ft.; while the best side construction arch carried only 8,574 lbs., or 953 lbs. per sq. ft. over a loaded area of 9 sq. ft. These were 10in. terra-cotta arches of 5ft. span; hence they were fair samples of modern use. The tests made by Geo. Hill, M.Am.Soc.C.E., on Melan and terra-cotta arches, by means of a self-registering hydraulic machine, show only one terra-cotta arch out of eleven tests which would fulfil the necessary requirements, viz., a 10in. hard terra-cotta end-construction arch, which sustained a total load of 57,500 lbs. over a loaded area of 20 sq. ft. out of a total arch area of 22·6 sq. ft. The other ten arches ranged from 10,000 to 16,000 lbs., ultimate loads. All the Melan concrete arches showed an ultimate capacity of more than the required 40,000 lbs. Most, if not all, of the New York Building Department tests would also have failed to show this ultimate capacity, which would be necessary not only under normal conditions but under fire and water tests as well. Several of the concrete arched forms now in common use will probably exceed this required strength, but if the floor construction as a whole were to be proportioned equivalent to the concentrated load assumed for the beams, this might preclude the use of practically all flat terra-cotta arches and all slab concrete construction.

Partitions

are often classed as live loads, and in previous Chicago practice these were often assumed to be live loads distributed uniformly over the floor area at 25 lbs. per sq. ft. This was on the assumption that the position of partitions might frequently be changed to suit the subdivision of office areas as required by tenants. The present New York and Chicago building laws, however, both require partitions to be considered as dead loads.

As pointed out by the author, the live loads on

Warehouse and Factory Floors

will vary greatly, these often being far greater than might be expected and often much less. Mr. W. L. B. Jenney, the well-known Chicago architect, had occasion to estimate the loads in the wholesale warehouse of Marshall Field & Co., in Chicago, and the low average of 50 lbs. per sq. ft. was found for the total floor area, including all passageways, in spite of the very large quantities of merchandise usually stored there. The maximum load on limited areas was found to be 57 lbs.

Weights of Crowds.

Mr. L. J. Johnson, Assoc.M.Am.Soc.C.E., said he had made experiments on the weights of crowds of students, and found that 156 lbs. per sq. ft. was attainable without any attempt at selecting the men or crowding them to any painful degree of personal discomfort: and though 150 lbs. per sq. ft. could be reached only rarely, 80 or 100 lbs. per sq. ft. must be realized far more often

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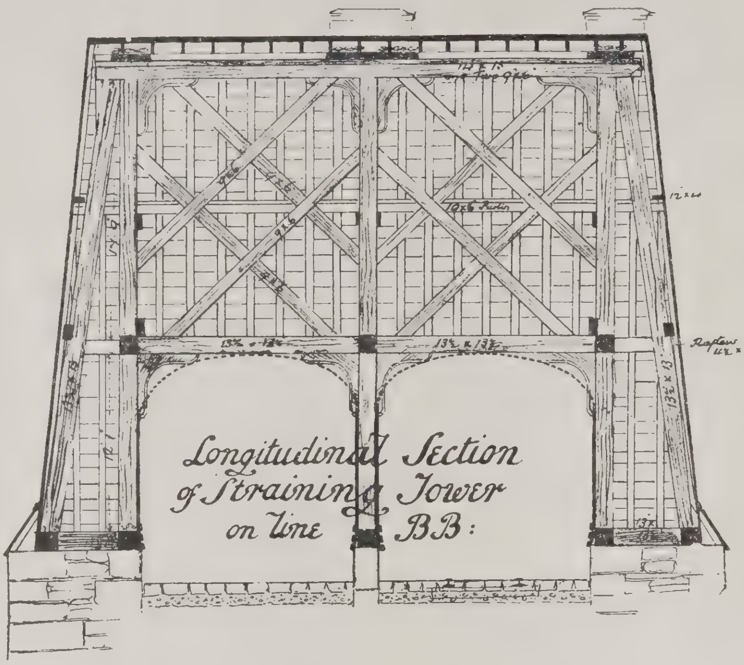
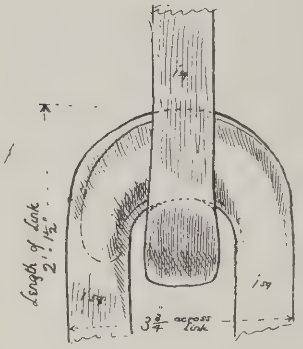
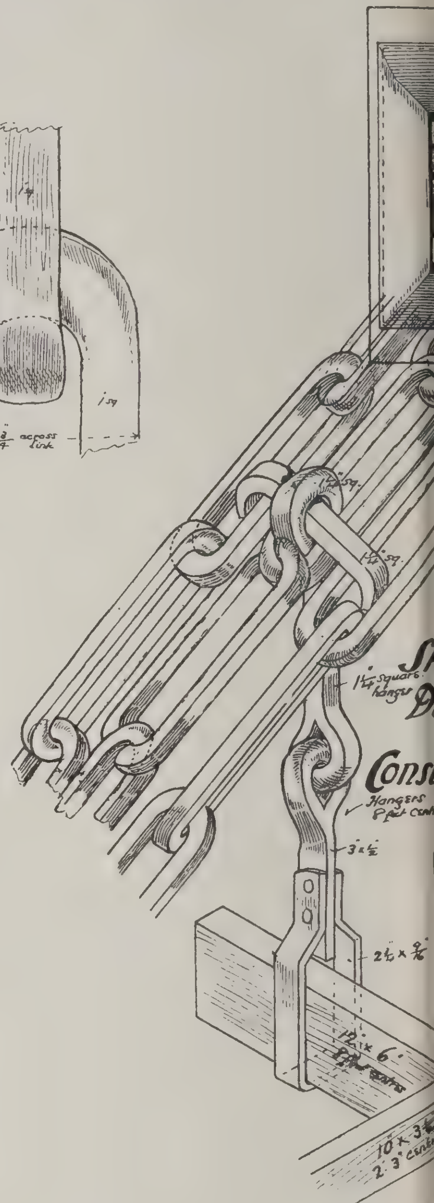
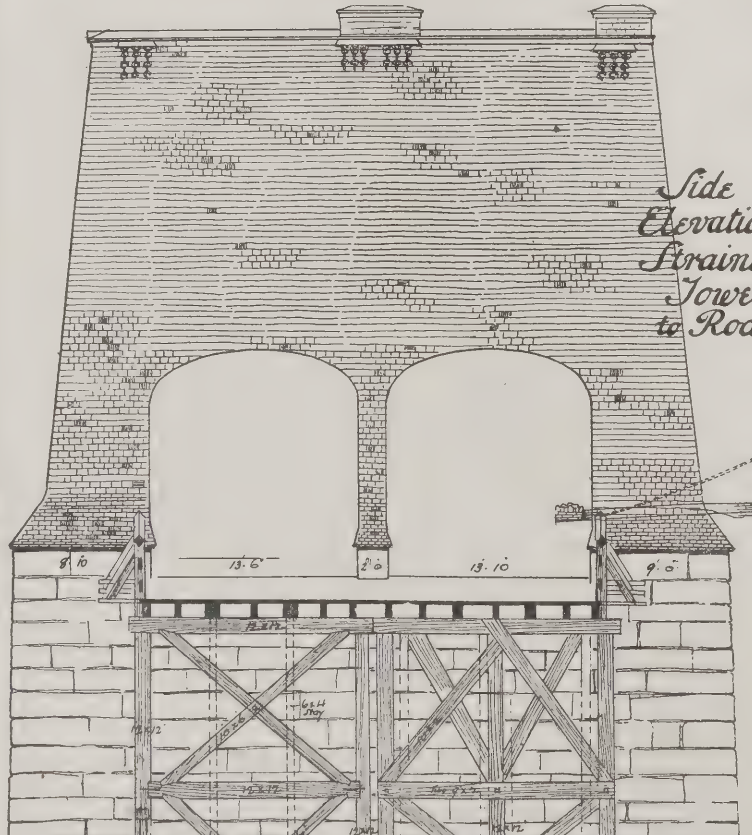
Wednesday, April 5th, 1905.



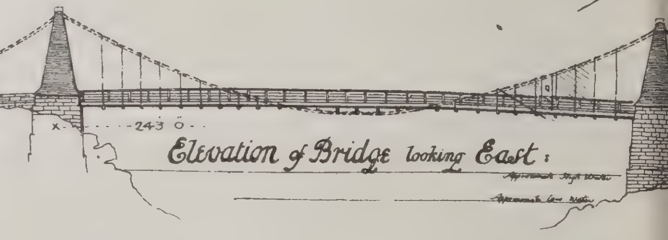
Longitudinal Section of Straining Tower on Line BB:



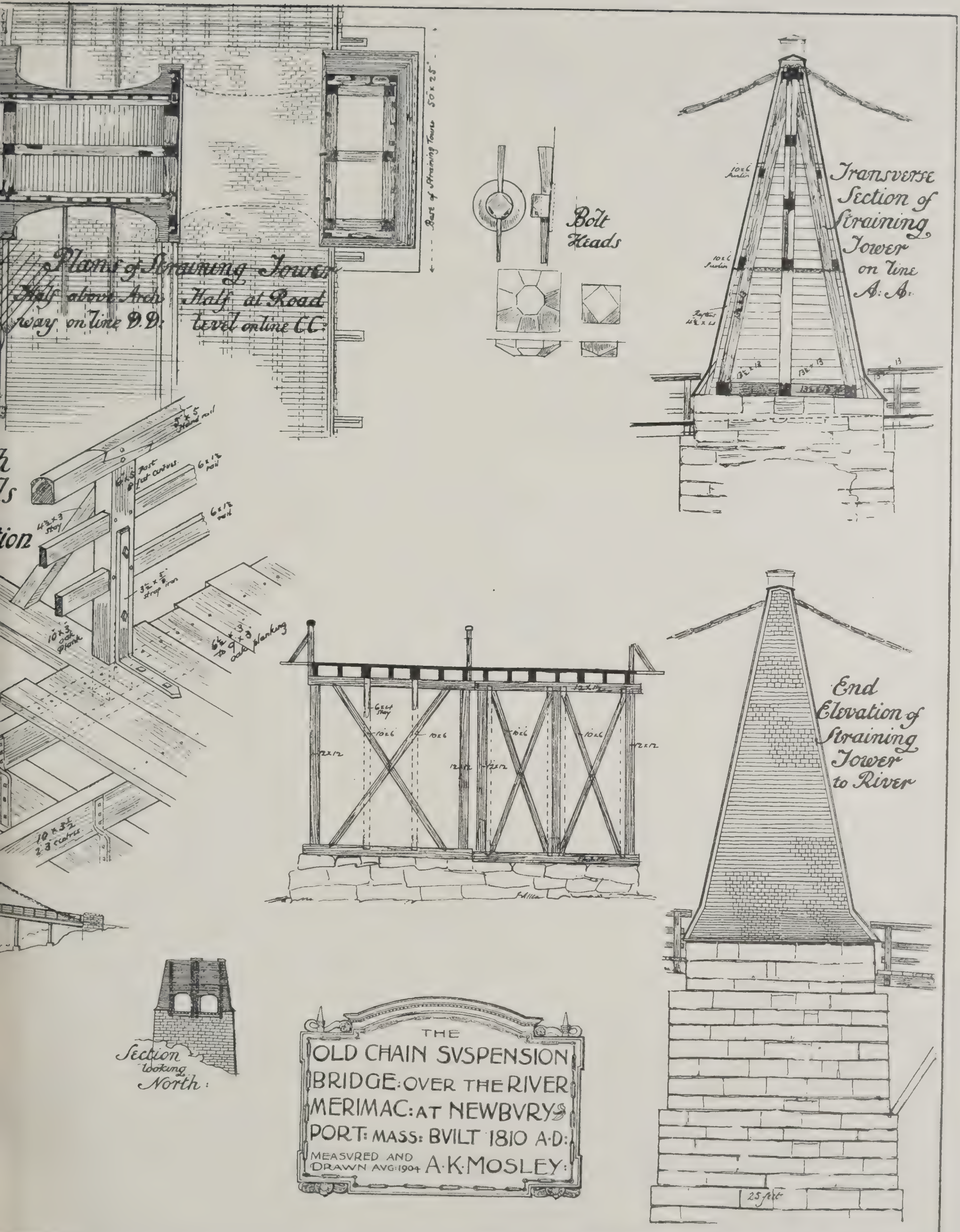




Side Elevation of Straining Tower to Road



Elevation of Bridge looking East:



THE
OLD CHAIN SVSPENSION
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than was commonly supposed. A crowd of 80 lbs. per sq. ft. could easily make way so as not to afford serious obstruction to the progress of a person who wished to go through it, and a little persistence would enable a person to make his way through a willing crowd weighing 120 lbs. per sq. ft. Mr. Johnson considered that the floors of passageways, corridors, standing-room in theatres, assembly-rooms without fixed seats, ballrooms, &c., should be calculated for a weight closely approaching 150 lbs. per sq. ft., or even more in some cases. The distributed-load values given in Table 2* ought to be increased materially, at least for ground floors of office-buildings, assembly-rooms and staircases leading thereto, and in many cases for pavements.

Safes.

Mr. George H. Blakeley, M.Am.Soc.C.E., said that if it was proper to provide for supporting a 5,000 lb. safe, then only in exceptional cases could the entire weight of the safe be carried on a single joist. Such a safe would occupy an area of about 3ft. by 5ft., and it was proper to consider such a distribution of the load in designing. With joists of 15ft. span and spaced 5ft. apart it was impossible to place such a safe in any position where it would produce a loading of a single joist in excess of that caused by a centre load of 3,500 lbs. It would be proper to specify a definite area covered by the concentrated load, instead of considering it under the impossible condition of being concentrated at a mathematical point. Such a modification would produce, in general, a reduction of the sizes of floor joists, and without impairing the adequate carrying capacity.

Bookcases.

In the case of office-buildings occupied by lawyers it was possible to have bookcases filled solid with books from floor to ceiling, and on each side of the partition over a girder, producing a load of from 400 to 450 lbs. per lin. ft. of girder. Such offices were usually of fair size, and after deducting the effect of the bookcases there might be left in the girder a carrying capacity of less than 30 lbs. per sq. ft. of the floor of the offices. Such offices at times might be fairly crowded with people, as in the case of an important hearing before a referee, and might have a floor load of at least 50 lbs. per sq. ft. caused by a crowd of people at such a time.

Store Buildings.

In the case of store buildings a live load of 1,000 lbs. per lin. ft. for girders was insufficient. In such buildings the tendency was to space the columns far apart, and 20ft. from centre to centre was not unusual. For such a case, with joists spaced at 5ft. centres, according to the proposed specification, the joists would be designed for a live load equivalent to 160 lbs. per sq. ft., while the girders would be designed for a load of only 50 lbs. per sq. ft. On a limited area in such buildings it was not unusual to have a crowd of people equivalent to at least 80 lbs. per sq. ft., especially on "bargain days" and during the holiday season. It was perfectly possible that on such occasions areas affecting a girder in such a building would be loaded considerably in excess of 80 lbs. per sq. ft., as against the 50 lbs. per sq. ft. provided for by the proposed specifications.

Weights of Various Goods.

Crockery and glassware in crates, set side by side and not piled, would produce a load of 120 lbs. per sq. ft., and flannels in cases, piled 4ft. high, 100 lbs. per sq. ft.; cotton prints in cases, set side by side and not piled, 93 lbs. per sq. ft.; woollen dress goods, in cases set side by side and not piled, 84 lbs. per sq. ft.; brown-sugar barrels, set side by side, 113 lbs. per sq. ft. These and other articles handled in store buildings would at times accumulate over certain areas and fully load the girders; therefore, in the design for such buildings the possibilities of such loadings should be considered and the girders be designed accordingly.

Mr. Oscar Lowinson, Assoc.M.Am.Soc.C.E., said the author's effort to establish

A Standard Specification for Structural Work

was deserving of the highest commendation, and its success would be demonstrated by its adoption, with such modifications as would be dictated by a more detailed experience than the author possessed in parts of the field which he had covered.

Live Loads.

His live loads for dwellings, hotels and apartment-houses, however, were too small. Take a dwelling, for instance. In the life of every family there occurred periods during which the apartments were crowded. A minimum allowance for live load in dwellings should be 65 lbs. per sq. ft. In country residence work Mr. Lowinson said he designed the first floor for a live load of not less than 80 lbs. per sq. ft., and in city houses the sizes of the beams and girders were usually determined by their deflection, which should not exceed $\frac{1}{30}$in. per ft. because of the danger of cracking plastered ceilings. For pavements it had been his practice to design for a live load of 350 lbs. per sq. ft., and he suggested that the distributed load be made equal to that figure. For the pressure on wall-plates he would use 200 lbs. instead of 350 lbs.

Commenting on Mr. Schneider's paper, the "Engineering News" of New York says:—

Mr. Schneider's scale of live loads deserves approbation because it specifies, almost for the first time, that floors must be designed to stand a suitable concentrated loading as well as a distributed load. It will have done its duty if it leads to the recognition of concentrated loads in those specifications which, above all others, should prescribe carefully-chosen loadings for designing buildings—public building laws.

While agreeing with Mr. Schneider in the principle of recognizing concentrated as well as distributed loads in building calculations, we cannot agree with him in the actual loads which he specifies. His distributed

Loadings for Floors

are far below those which may occur, and are therefore too low, in our opinion, as designed loadings. This criticism applies solely to classes 1 to 8 in the table, that is, to those cases where the structure is exposed to a distributed loading due to people massing upon it, rather than to loads resulting from stored material. In the latter case, of course, the loading to be used in the design depends upon the conditions of the individual case; and for the same kind of building it may be necessary, in the building law of a given city, to specify a higher loading than is used in some other locality. But crowds of people do not vary in their characteristics from place to place, and they are much alike when they invade a dwelling or an office and when they crowd a political meeting hall. It is possible to set down a loading which will apply to all cases, making perhaps a percentage addition for cases where the crowds are apt to be very lively or to move in unison—meeting halls, armouries or ballrooms. On this account, also, it is possible to criticize Mr. Schneider's scale of distributed loads without reference to any particular case.

No argument is required to support the statement that in designing structures we should plan for

The most unfavourable Conditions of Loading

which can be foreseen. This practice is almost universal in structural designing; indeed, an evasion of it is at once stigmatized as an effort to "skin" the design, to secure business by jeopardizing the security of the structure. If this principle governs the planning of structures which must support mere dead material, structures whose failure would likely not involve injury to persons, how much more stringently should it control the design of a structure where the extreme conditions of loading are precisely those which would lead to the greatest loss of life! A certain floor, for example, may have smaller chances of experiencing the load of a maximum crowd of people than has a coal-bunker of experiencing its most unfavourable loading, but in the former case a collapse is far more disastrous, and safety therefore should engage the greater consideration.

Some careful experiments on

The Maximum Weights of Crowds

of people were reported by Prof. L. J. Johnson in "Engineering News" of April 14th, 1904. These gave weights up to 157 lbs. per sq. ft., with the suggestion that a weight of 160 lbs. might be reached in an absolutely compact stationary crowd. Similar tests made in Germany showed weights up to 145 lbs. per sq. ft., with a degree of crowding that still allowed motion within the mass. Few people have not experienced a degree of crowding where the interior of the mass was compacted to absolute standstill. And judging by the German as well as the American experiments, this may give a loading exceeding 150 lbs. per sq. ft.

Grounds for assuming 40 lbs. per sq. ft.

On what grounds, then, are we justified in using a loading of 40 lbs. per sq. ft., such as Mr. Schneider prescribes for dwellings, hotels, apartment houses, office buildings, theatres, churches, schools, stores and light manufacturing establishments? That dense crowding does occur, and by no means as an exceptional occurrence, in the case of theatres, churches and the like, is known to all. That it may occur in hotels, in apartment houses and even in private dwellings is equally evident, though it is recognized as being less frequent and for a given case less probable. We are not accustomed to designing for average or probable loads: on the contrary, we cannot in good conscience plan for anything less than the greatest loading which the conditions of the case make possible. It would be curious engineering were we to design the framework of an apartment house on the basis of average loading, or were we to neglect the higher loading that would occur only once in a year or once in five years or once in ten years. Do we build apartment houses to fall once in ten years?

The author's expressed argument for this scale of loads is brief and unsatisfactory, and need not be gone into at present; it is based on a single statement covering a few chance observations, which are mere negative testimony in the present discussion. But if we enquire what grounds may have led the author to be satisfied with his ultra-low loadings we may find

Two Explanations.

First, he assumed that the distributed load is of little importance, since ordinarily the concentrated loads would predominate in effect, or second, he relied upon the mysterious margin of the factor of safety. These reasons need no lengthy discussion here to controvert them, but may be left to stand on their merits. For our part, if, as a matter of approximating actual conditions, we are to classify loads as distributed and concentrated, we should wish to select the design load in each class as near as possible to actual maximum. And if we use a given factor of safety in a design to cover unknown and largely unknowable dangers from variations in assumed conditions, we should preferably not encroach upon that margin by a neglect of known dangers. It is to be borne in mind that the actual possible loading of 150 lbs. per sq. ft. is nearly four times as great as Mr. Schneider's specification of 40 lbs.

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* See p. 166 of last week's issue.

R.I.B.A.

Planning of Cities and Public Spaces.

A MEETING of the Royal Institute of British Architects was held on Monday evening at 9, Conduit Street, W., the chair being occupied by the president, Mr. John Belcher, A.R.A. The decease of Mr. Frederick S. Waller, Fellow, and Mr. S. J. Nicholl, Associate, was announced.

Papers on "The Planning of Cities and Public Spaces" were then read by Mr. John W. Simpson, F.R.I.B.A., and Prof. Beresford Pite.

Mr. Simpson's Paper.

Mr. John W. Simpson, after a reference to the literature on the subject and an expression of his indebtedness to the works of Herr Stübben, of Cologne, and Herr Camillo Sitte, of Vienna, remarked that the artistic side of city planning had been almost entirely neglected in England; our authorities, he supposed, did not even realize its existence. The laying-out of new streets and roads is nowadays looked upon as purely technical engineering. It was not thus that the cities were created which are still the wonder and delight of the civilized world. The Greeks in the Acropolis, the Romans in the Forum, have given us a model for all time of the way to concentrate the forces at our disposal for the beautifying of a city. Contrast the effect of such spaces, enclosed by splendid edifices and adorned with countless masterpieces of plastic and architectural art, with the forlorn bronze figure stranded on its pedestal amid a tearing stream of traffic which represents the modern idea of a public monument. The "place" of mediæval and Renaissance times, the direct descendant of the antique Forum, has been entirely ignored in our modern city plans. Granted that modern conditions render the "place" no longer necessary as a common centre of exchange and commerce, yet we may do well to examine our fathers' work and save of the artistic heritage what may be adapted to our circumstances.

Exhibiting on the screen plans of various ancient "places" in Italian, German and Flemish cities, the author brought out that, despite their apparently aimless irregularity, they were in reality constructed upon definite principles. With a city we must husband our resources if we are to obtain an artistic whole. If we scatter indiscriminately the material which makes for beauty (and for our purpose this material is represented by the public buildings and monuments) it will be swallowed up in the general mass, and fail of its full effect. In the ancient "places" the statues, fountains and other monuments were placed not in the centre of the space but at the sides. Fountains naturally should be placed beside the beaten trackway. As Donatello's statue of Gattemala and the little column stand at the side of the entrance of the church of St. Anthony of Padua, so the obelisks and statues of the Pharaohs rose beside the doors of the temples. The ancient churches in Italy were most often engaged on one or more sides with other buildings, and the author gave several illustrations to show how this tended to produce those groups of open places which give such charm to the buildings. The enclosing of the old public "place" was an important feature and a principal element of its charm. No mere open space between streets will give it—the appearance of an unbroken frame of buildings is essential.

The author's illustrations made evident two leading principles. First, the monuments being placed at the sides, the centre of the square is left free, and the space is enclosed by a continuous frame of buildings. Next, the "place" must be proportionate in size and shape to the buildings to which it is to give value. Generally speaking, the space in front of a church or other vertical composition will be found to be deep, while that before a town hall or other building whose characteristic is length is usually wide. The irregular plan of ancient "places," though not in accordance with our modern ideas of "symmetry," do not distress us in execution—they appear natural. The builders did not trouble about theoretical symmetry, but they realized in practice what actually caught the eye. The author directed special attention to the Signoria at Florence—from an architectural point of view the most remarkable square in the world. Its form and size, the disposition of its monuments and buildings, the way in which the streets deliver into it, are all admirably studied. No effort is apparent, and the superb composition is admired without disturbing thoughts as to the causes of its beauty. Again, the plans of the Piazza di San Marco and the Piazzetta at Venice exemplify with the most refined art the principles deduced as to the placing of monuments, the freedom of the central space, the enclosed frame, the absence of geometrical regularity, and the value given to squares by their combination with others of varying form and size.

Passing on to street planning, the author referred to the theoretical systems, rectangular, radiating or triangular, as being one and all devoid of artistic interest; nor did such a consideration enter the minds of the engineers who designed them. They had failed even to solve satisfactorily the practical problem of constructing the shortest route between any two points so as to save time in transit. In ancient towns nearly all side streets entered main thoroughfares at right angles; in the modern triangulated and radiated schemes acute angles were inevitable. Again, the ancients avoided as far as they could the delivery of several arteries of traffic at the same point. This principle was now quite neglected. Considering that the chief object of modern street planning is to save time in getting from one point to another, and not merely to construct the geometrically shortest routes between them, the author turned to the streets of Bruges and the fourteenth century in search of guiding principles, illustrating his points by the aid of diagrams. In the whole of Bruges there is hardly a street which formed an acute angle with another, nor a crossing of more than one street with one other. Where a street approached another obliquely, or threatened a complicated intersection, its line would be curved so as to avoid acute angles and confusion. Again, the principle of framing the view by enclosing it and preventing distracting perspective is carried out with as delicate an art in the plans of ancient streets as in those of open "places." The more limited the impression the more complete is its effect was the sound axiom of art which, consciously or by tradition, guided the old street builders. There is no reason, either practical or artistic, why our streets should have monotonous parallel sides. The author took as an example the characteristic little "Rue de St. Armand" at Bruges. Not only is such a varying line picturesque and advantageous to the buildings, but it affords exactly those spaces for the cab-stands, telephone and fire-escape kiosks and other constantly increasing requirements which are difficult to provide for and cause obstructions in uniformly regular streets. Violent bends are not necessary; a slight curvature or displacement of the axis line will produce the happiest effects. The concave line of frontage is the most valuable in improving the appearance of a street, and it should be broken as little as need be. In conclusion, the author asked, Is it hopeless to suppose that in time our authorities may perceive that mere pulling down, aligning and widening of streets will never meet our traffic requirements, and that what is needed is artistic and considered planning? To the Institute students especially he commended this problem. Let them not be content to continue by mere tradition the measurement and study of the individual building and its details, important though these be. There lies a rich reward for those who will consider the combination, construction and grouping by which effect is gained; and the R.I.B.A. Prize Committee might perhaps judiciously stimulate synthetic as well as analytic investigations.

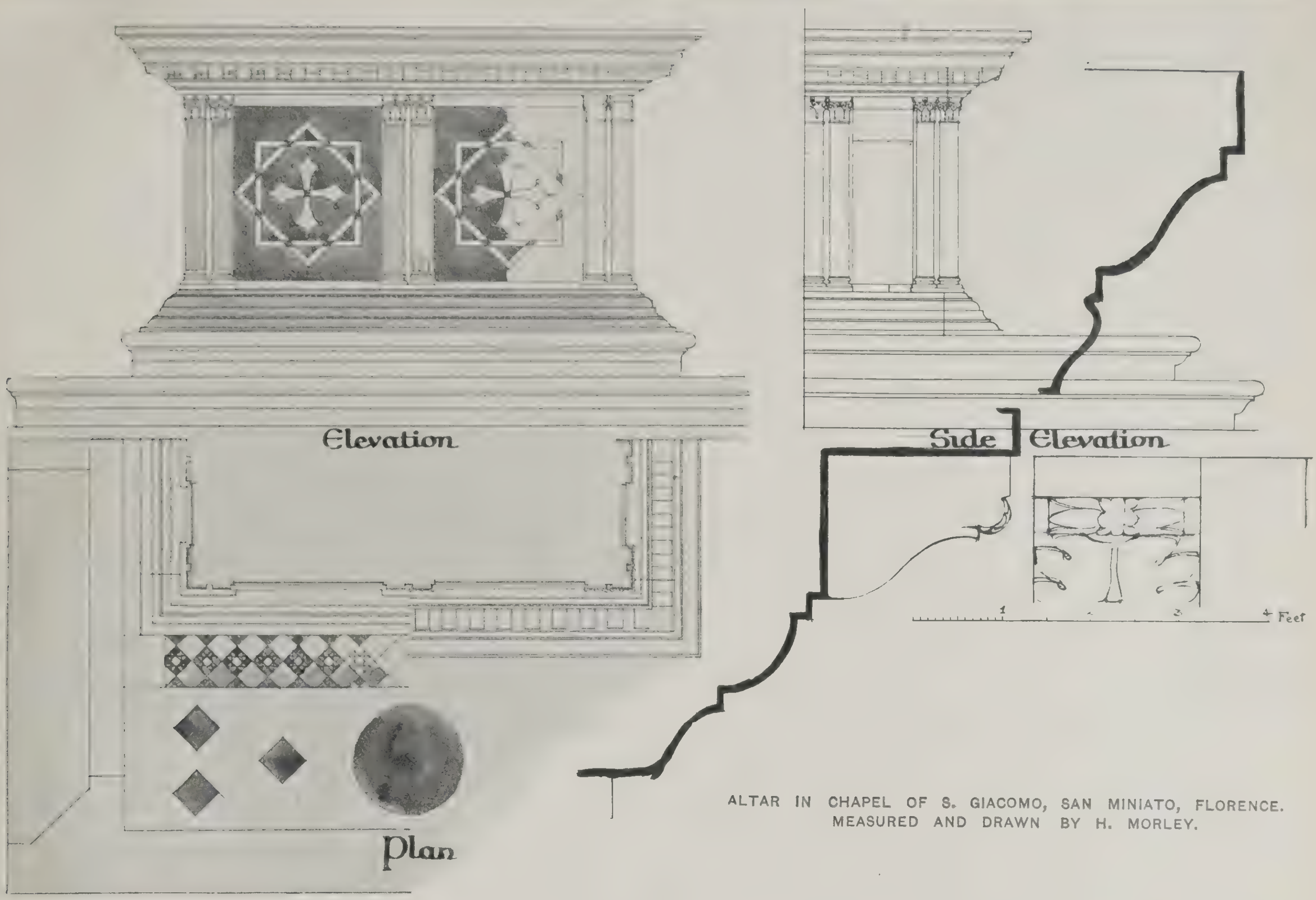
Prof. Beresford Pite then read a paper with special reference to the planning of London. A discussion followed in which Messrs. Freeman, Walter Crane, Captain Hemphill (of the London County Council Improvements Committee), H. V. Lanchester and John Belcher took part. We shall publish a report of Prof. Pite's paper and the discussion next week.

FIRES IN CHURCHES.

ATTENTION is drawn by the Fire Brigade Committee of the London County Council to the serious fire which occurred on February 26th at Christ Church, Down Street, Piccadilly, with the result that about one-third of the ground floor and the gallery were severely damaged. The Committee state that the doors of this church and of most other churches open inwards only, and they point out that disastrous consequences would follow in the event of a fire occurring during a service and a panic ensuing. Under section 80 of the London Building Act, 1894, in all churches erected since the passing of the Act all doors and barriers are required to be made to open outwards, and no outside locks or bolts may be affixed thereto. In the London Building Acts Amendment Bill a clause was inserted to make this provision apply to existing churches, and also to require that the doors should, if fastened during the time the buildings were in use, be fastened during such time by automatic bolts only, so as to open outwards by pressure from inside. This clause was in the part of the Bill withdrawn, and as the Building Act Committee are reporting with regard to this part of the Bill, they have informed the Fire Brigade Committee that they do not think that any action can be taken in the meantime.

Power Companies.—The following interesting list of electricity supply companies in Great Britain is extracted from an article which appeared in the "Times" engineering supplement for March 29th:—

—	Area in sq. miles.
I.—Companies Supplying.	
South Wales Electric Power Distribution Co.	1,034
Midland Electric Corporation for Power Distribution	70
Newcastle-upon-Tyne Electric Supply Co.	375
County of Durham Electric Power Supply Co.	250
North Metropolitan Electric Power Supply Co.	325
Yorkshire Electric Power Co.	1,800
Derbyshire and Notts Electric Power Co. (temporary plant)	1,570
II.—Companies Erecting Plant.	
Lancashire Electric Power Co.	1,100
Clyde Valley Electrical Power Co.	730
Cleveland and Durham County Electric Power Co.	820
Fife Electric Power Co.	504
Leicestershire and Warwickshire Electric Power Co.	1,340
North Wales Electric Power Co.	2,100
Scottish Central Electric Power Co.	400
III.—Other Companies.	
Kent Electric Power Co.	1,485
Gloucester Electric Power Co.	329
Cornwall Electric Power Co.	1,100
Shropshire and Worcestershire Electric Power Co.	—
Somerset and District Electric Power Co.	—
North-Western Electricity and Power Gas Co.	700
Carmarthenshire Electric Power Co.	—
Lothians Electric Power Co.	500
Loch Leven Water and Electric Power Co.	—
Belfast and North-East Ireland Electricity and Power Gas Co.	—
Shannon Water and Electric Co.	2,800



ALTAR IN CHAPEL OF S. GIACOMO, SAN MINIATO, FLORENCE.
MEASURED AND DRAWN BY H. MORLEY.

Builders' Notes.

The Building Trade in Leicester is reviving.

Messrs. Holloway Brothers (London), Ltd., of Belvedere Road, S.E., write pointing out that Mr. Thomas Holloway, of No. 19, Cedars Road, Clapham Common, who is one of their principals, is not the Mr. Thomas Holloway who is engaged in certain building operations at No. 171, Strand, W.C. They are not concerned with any other firm carrying on business under the name of Holloway.

Suing the War Office.—Mr. Kerswill, contractor, of Plymouth, has obtained, on petition to his Majesty the King, permission to sue the War Office in respect of a claim for work done at the Citadel. As the law stands, a Government department cannot be sued by writ in the ordinary way, but the permission to sue can always be obtained by the presentation to the Sovereign of a petition of right.

A Steel-Frame Warehouse is to be erected at the Alexandra Docks, Newport, by Messrs. Graham, Morton & Co., Ltd., of Leeds. The building will be 200ft. long and of 70ft. span, and the whole of the ironwork—including roof-principals, purlins, riveted compound steel girders, rolled-steel girders, gutterings, &c., and a specified number of casements constructed to open in the centre—is to be in position eight weeks from the date of the order. Best quality mild steel will be used. The principals are to be spaced 12ft. 6ins. apart, and a louvre will run the whole length of the building.

London Building Acts Amendment Bill.—At last week's meeting of the London County Council Mr. John Burns, M.P., made a vigorous attack on Dr. Napier and Mr. Shepherd, chairman and vice-chairman of the Parliamentary Committee, for their lukewarm support of the ill-fated London Building Acts Amendment Bill. Mr. Burns said that Dr. Napier had damned the Bill with faint praise and Mr. Shepherd had followed suit, and had it not been for the fact that the City dared not take the responsibility the fire clauses would have gone the way of the others.—The Council instructed the Parliamentary Committee to confer with the Building Act, Public Health and Fire Brigade Committees in regard to any future modifications of the Bill.

Brickworks for the Victorian Government.—Mr. Bent, the Premier of Victoria, has ordered machinery for State brickworks, in pursuance of his declaration that the brick combine is artificially maintaining prices and must be fought.

The Largest Reinforced Concrete Arch Bridge is the Gruenwald Bridge over the Isar, near Munich, Bavaria, which was opened for traffic towards the close of last year. It has two main spans constituting three-hinged arches, and a number of small girder spans, all of reinforced concrete. The two main spans are each 230ft. with a rise of 42ft. and a width of 26·2ft. from centre to centre of hinges. The five girder spans are each 28ft. in the clear. The roadway is 30ft. wide. The total length of the bridge is about 720ft. The structure is a highway bridge, and was designed for a live load of 82lbs. per sq. ft. uniform, and a 22-ton steam load roller. The hinges of the main arches are of steel castings with a convex-concave rolling surface. The "open spandrel" style of construction has been adopted to reduce the dead load as much as possible. The thickness of the arch ring (which at the crown is only 30ins., at the springing lines 36ins., and at the thickest portion—about the quarter points—but 48ins. deep) defines results which have barely been reached with stone.

Decay of Galvanized Iron Pipes.—Commenting on this subject the "Gesundheits-Ingenieur" says that in damp clayey soils zinc would seem to furnish a very inadequate protection against rust; indeed, it appears possible that it rather tends to facilitate galvanic action, and thus to hasten the destruction. Steel tubes have been found in these situations to last better than the common iron barrel, but the best plan, where the decay is ascertained to be rapid, is to use cast-iron pipes. Professor Steuer has suggested that the destructive action in clay soils may possibly be due to the fact that most tertiary clays contain a considerable amount of finely divided iron pyrites. This, in the presence of carbonate of lime, tends to result in the formation of calcium sulphate, setting free a certain proportion of sulphurous or sulphuric acid. Under these conditions, even though but very minute traces of the acids exist in the soil, galvanic currents may be generated which rapidly cause the destruction of the iron pipes.

The Galvanized Roofing Sheet Industry has been far from satisfactory for a long time past. Prices of spelter have advanced materially from the lowest point of last year, when G.M.B. Silesian sold at £20 12s. 6d. per ton. This year it has been as high as £25 7s. 6d., an advance of about 25 per cent., and although it has since declined about £2 from that high level the market shows again an advancing tendency. Prices of plates have also risen. There has been no corresponding advance in finished roofing sheets, as the supplies coming upon the market have more than sufficed to meet the demand, and competition has been keen for some time. Prominent members of the trade have had under consideration methods to remedy this condition, and last week about 150 manufacturers representing works in all parts of the country dined together at the Midland Grand Hotel, London, and afterwards discussed the situation. Proposals were brought forward having in view such a combination of manufacturers as would prevent over-production and regulate the market in a way more conducive to the producers' interest than the present independent action. The proceedings were necessarily of a more or less preliminary character, but at the same time material progress was made towards the ends proposed by the promoters of the meeting, the general impression being that an effective combination would speedily be effected.—As an outcome of the meeting a combination of the manufacturers of galvanized sheets has been formed. The first effect of this combination is the adoption of a minimum price of £10 5s. per ton for 24-gauge corrugated sheets in bundles f.o.b. Liverpool — an advance of from 7s. 6d. to 10s. per ton over prices accepted within the past week. There are still details to be arranged, but the present position shows that the combination practically embraces the whole of the galvanized sheet makers.

Messrs. Horace W. Cullum & Co., of 28, Budge Row, E.C., makers of the "Kulm" fireproof and soundproof partition slabs, have removed to Craven House, Kingsway, High Holborn, W.C.

Labour in the Colonies.—This month's report of the Emigrants' Information Office, 31, Broadway, Westminster, states that the labour market at Adelaide is overcrowded, and no working man is advised to go to South Australia unless he is specially skilled in his trade or has sufficient money to live on at first. In New Zealand men in the building trade are well employed. In Cape Colony there are considerable numbers of men out of work. No one is allowed to land unless he has secured employment or possesses £20 on arrival. No one may enter the Transvaal without a permit.

Dublin Building Trade Dispute: Bricklayers Imported.—Between fifty and sixty bricklayers arrived by a cross-Channel steamer at Dublin last Wednesday to replace the members of the Brick- and Stonelayers' Union who have been locked out. They took up their work under the protection of the police. At a meeting of the North Dublin Union held on the same day a resolution was passed requesting the Master-Builders' Association to appoint three members to meet a similar number of the Bricklayers' Society in conference, under the presidency of the Archbishop of Dublin, with a view to a settlement of the dispute.

Keystones.

Bitumen and Wood-fibre Paving Blocks are being tried by the Norwich Corporation.

Building Stones.—The sub-committee of the Architectural Association have received particulars of more than 200 building stones in response to the invitation issued with last month's "Notes." They will be glad if others having information on the subject will communicate with them at once, so that the record may be made as complete as possible.

The Competition for Improving Barcelona, including the beautifying of the working-class quarters and the unifying of the suburbs (for which premiums of £1,400, £400 and £200 were offered), only attracted five architects—two Spanish, one German, one Italian and one French. It was won by the last-named—a young student named Jaussely, the son of a working carpenter, who gained the Prix de Rome for architecture in 1903.

The Rapid Growth of Liverpool is illustrated by the annual report of the City building surveyor, Mr. William Goldstraw. During the nine years since the boundaries of the city were extended no fewer than 17,414 houses have been erected, of which last year alone accounted for 2,174, and although this figure was surpassed in 1903 and 1899 the number is still 269 above the average of the previous eight years.

Leeds Waterworks Engineer.—Mr. Henzell, of Newcastle-on-Tyne, is recommended for the position of waterworks engineer to the city of Leeds, at a salary of £1,000 a year. There were originally fifty-four applicants for the post, reduced later to nine.

Hyde Abbey, Winchester, to be Explored.—The site of the ancient Abbey of Hyde (a portion of which was acquired by the city of Winchester) is to be explored and the foundations of the abbey are to be uncovered.

The new Exe Bridge at Exeter (described on p. 58 of our issue for August 3rd, 1904) was opened last week. It is a one-span steel bridge, and has cost £25,000. The design was prepared by Sir John Wolfe-Barry and Mr. C. A. Brereton, and was executed by Messrs. Woodman & Sons, of Exeter.

Competition for Shire Hall, Bury St. Edmunds.—This competition has been decided as follows:—First premium (£50), Mr. Arthur Field, Ipswich; second premium (£30), Mr. Omar Mahomed and Mr. Betram H. Tarrant, Balham; third premium, Mr. Septimus Warwick and Mr. Herbert H. Hall, London, W.

Leeds Queen Victoria Memorial. — The design of Mr. Frampton, A.R.A., has been accepted for this memorial. The statue, which is to be of bronze, representing the late Queen in a sitting position, will be erected in Victoria Square. The memorial will be about 30ft. high and will have on either side figures of "Peace" and "Industry."

The new Carnegie Baths at Dunfermline were formally opened on Friday. The buildings have been designed by Mr. Hippolyte J. Blanc, R.S.A., and are expected to cost £36,000. A gymnasium 103ft. by 45ft. is included in the scheme. There are two paths around the swimming bath—one for bathers and the other for those going to and from the dressing-boxes.

Glasgow and West of Scotland Technical College.—On Wednesday last the students and staff of the architectural department met to express their feelings of goodwill towards Professor Gourlay, B.Sc., A.R.I.B.A., on the occasion of his approaching marriage. Mr. Vernon Constable occupied the chair, and was supported by Mr. John B. K. McTaggart, who presented the professor with a handsome combined bookcase and curio cabinet bearing a suitable inscription.

Restoration of York Minster. — Simultaneously with the work of restoring the west front of York Minster, now proceeding, it has been decided to restore the north and south aisles of the nave by the erection of the missing pinnacles and flying buttresses on the north side and the flying buttress on the south side. The whole of the work will be in Ketton stone. Designs have been prepared by Mr. G. F. Bodley, R.A., for a new oak pulpit in the nave to cost about £600.

The Condition of St. Mark's, Venice, now that it has been possible to examine the church closely, is found to be graver than appeared from the report of the two engineers, Signori Manfredi and Marangoni. The weakest points are the "Paradise" and "Apocalypse" vaults. Though every care will be taken to maintain these as they were originally, some parts of them will have to be demolished and rebuilt. The examination of the interior structure of the St. Alipio corner, which was excluded from the restorations made about the middle of the nineteenth century, has revealed an even graver state of things. The foundations of this corner have sunk and have become detached from the remainder of the building, so that the corner now stands independently from the rest, with only one iron bar, put there in 1780, to keep it and the main body together. The corner will have to be demolished (each piece being religiously preserved for reconstruction) in order to strengthen the foundations.

Art and Architectural Education in Russia.—The leading institution in Russia for the teaching of art and architecture is the Higher School of Fine Arts at St. Petersburg, in connection with the Imperial Academy. This is divided into two sections, one for painting and sculpture and the other for architecture. Provision is also made for the training of art teachers. Next in importance are the School of Painting, Sculpture and Architecture at Moscow; the Strogonoff School of Technical Design, also at Moscow; Baron Schtiglitz's Central School of Design at St. Petersburg, with more than 2,000 students; the Drawing School of the Imperial Society of Arts at St. Petersburg; and the Gogol School of Industrial Art at Mirgorod, which has about 700 students. Local schools of art also exist at Odessa, Wilna, Kharkoff, Kieff, Kazan and a few other towns, several of which are devoted to the benefit of local industries.

The Edinburgh Architectural Association recently visited Inveresk. Particular note was taken of the Roman remains in Inveresk House grounds, and the leader of the party (Mr. Thomas Ross, F.S.A. Scot.) declared that if the proprietors of the villa houses in the town were to unite they might at very little expense conduct some excavations on a very complete plan, and might make the Roman town of Musselburgh so that people would be enabled to form a better idea of the importance of the place in Roman times.—At last week's meeting the chairman, Mr. J. T. Baillie, referred to the loss which had been sustained by the death of Mr. George Henderson, whose work was always marked by scholarly as well as practical knowledge, and by well-trained taste.—Councillor M'Arthy delivered a lecture on "The Royal Mile—the Castle to Holyrood," in which he gave an interesting account of the numerous buildings of historical value to be found in the thoroughfare. His main object, he said, was to rouse interest in the remaining links with the past, and, if possible, to do something to secure their preservation.

The A.A. Students' Smoker, held at the Café Monico last week in aid of the New Premises Fund, was a great success. Mr. E. Guy Dawber, F.R.I.B.A., president of the Association, was in the chair, and about 400 members and friends were present. In the course of the proceedings Mr. Dawber announced that more than £20 had been contributed to the fund during the evening, and on behalf of the Association he cordially thanked the students for the effort they had made and the many artists who had so kindly given their services. The new premises had involved a debt of between £3,000 and £4,000, which it was earnestly hoped might be cleared off during the present year. Much interest was evinced in what purported to be an advance proof of the R.I.B.A. intermediate examination paper for June next. Among the questions set were the following:—

2. Is 5ft. 6ins. too high for a dining-room? If not, why not? Illustrate your answer from the works of V—ys--y.

3. What is the Purple Patch?

5. Have you ever built in Truth? If so, what did Labby say?

7. Give the author and context of the following:—

(*a*) "When we are registered,
"Why, what shall we do?"

(*b*) "Oh! this learning, what a thing it is!"
(*Taming of the Shrew.*)

(*c*) "Hullo, you funny little d-v-l, is that you or your hat?"

(*d*) "'Ere's the architect, let's 'eave a brick at 'im."

(*e*) "Everyone that was discontented gathered themselves unto the Cave Adullam."

(*f*) "Love's all right in a cottage, but wait till the chimney smokes."

(*g*) "Come join the crowd with me,
Come and be ploughed with me,
Down at the R.I.B.A."

Coming Events.

Wednesday, April 5.

ROYAL SANITARY INSTITUTE. — Inspection and Demonstration at Islington (conducted by Mr. James R. Leggatt), at 2 p.m.

INSTITUTE OF SANITARY ENGINEERS. — Election Committee at 3 p.m. Examination and Literary Committee at 5 p.m.

SOCIETY OF ARTS.—Mr. Richard N. Hall on "The Ancient Architecture of the Great Zimbabwe," at 8 p.m.

Thursday, April 6.

JUNIOR INSTITUTION OF ENGINEERS.—Visit to the Willesden Power House of the North Metropolitan Electric Power Supply Co., Taylor's Lane, Willesden, at 7 p.m.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—Mr. Philip H. Newman, F.S.A., on "Art Recollections of a Spanish Tour," at 8 p.m.

CHEMICAL SOCIETY.—Meeting at 8 p.m.

SOCIETY OF ORDAINED SURVEYORS. — Annual General Meeting at Edinburgh, at 8 p.m.

Friday, April 7.

ARCHITECTURAL ASSOCIATION. — Mr. H. Phillips Fletcher, F.R.I.B.A., on "The Buildings of the World's Fair at St. Louis, 1904," at 7.30 p.m.

ROYAL INSTITUTION. — Mr. Alfred Mosely on "American Industry," at 9 p.m.

GLASGOW TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Business meeting.

JUNIOR INSTITUTION OF ENGINEERS.—Mr. George H. Hughes, M.I.M.E., on "Practical Notes on Waterworks Construction," at 8 p.m.

INSTITUTION OF CIVIL ENGINEERS.—Mr. R. G. Clark on "Cofferdams for Dock Use," and Mr. J. R. Fox on "The Bath Corporation Waterworks Extension," at 8 p.m.

Saturday, April 8.

ROYAL SANITARY INSTITUTE. — Inspection and Demonstration at the Sewage Outfall Works, Barking (conducted by Mr. John Edward Worth, M.I.C.E.), at about 3 p.m.

ARCHITECTURAL ASSOCIATION.—Sixth Spring Visit to Æolian Hall, New Bond Street, at 2 p.m., and No. 2, Hamilton Place, Park Lane, at 3.30 p.m.

ROYAL SANITARY INSTITUTE.—Provincial meeting at Bristol. Discussion on "Isolation Hospitals," at 11 a.m.

NORTHERN ARCHITECTURAL ASSOCIATION. — Visit to churches of St. Hilda and St. Barnabas, Newcastle-on-Tyne, at 3.30 p.m.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—Meeting at Newcastle-on-Tyne, at 2 p.m.

Monday, April 10.

SURVEYORS' INSTITUTION.—Meeting at 4 p.m.

INSTITUTION OF CIVIL ENGINEERS. — Colonel Crompton on "Unsolved Problems in Electrical Engineering," at 8 p.m.

BRISTOL SOCIETY OF ARCHITECTS. — Annual General Meeting. "An Evening with the Lantern."

Tuesday, April 11.

SOCIETY OF ARTS (Applied Art Section).—Mr. J. Starkie Gardner on "The Monumental Treatment of Bronze," at 4.30 p.m.

CARDIFF, SOUTH WALES AND MONMOUTHSHIRE ARCHITECTS' SOCIETY. — Mr. W. Henry White, F.R.I.B.A., on "The Absence of a National Style in Modern Town House Architecture," at 8 p.m.

Wednesday, April 12.

ROYAL SANITARY INSTITUTE. — Inspection and Demonstration at the East London Soap Works, Bow, at 3 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Associates' Annual Business Meeting.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending March 31st twenty-six failures in the building and timber trades in England and Wales were gazetted.

S. SNOW, builder, West Hendon. R.O. March 23rd.

W. J. F. ANDREWS, builder, Tottenham. Adj. March 23rd.

H. ALDRIDGE, builder and contractor, Lewisham. Adj. March 21st.

F. W. MATTHEWS, house decorator, Dartmouth. R.O. March 21st.

CANWARDEN & PUDDEY, builders, Chiswick. Adj. March 22nd.

T. H. HAYES & Co., builders, East Sheen. R.O. March 25th.

C. POUTNEY, retired builder, Bewdley. Gross liabilities £2,434; creditors fully secured £2,156; estimated to rank for dividend £229; deficiency £223.

H. HUNTER, plumber, West Hartlepool. First meeting, Grand Hotel, West Hartlepool, April 6th, at 2.30. P.E., West Hartlepool C.C., April 20th, at 11.15.

A. FIDO, builder, Bristol. R.O. March 22nd. First meeting, O.R.'s, Bristol, April 5th, at 11.45. P.E., Bristol Guildhall, April 7th, at 12.

G. RAMSEY, painter and decorator, Widnes. First meeting, O.R.'s, Liverpool, April 5th, at 2. P.E., Liverpool C.C., April 6th, at 11.

F. C. J. BRETT, builder, Hythe. R.O. March 21st. P.E., Canterbury Guildhall, April 6th, at 10. First meeting, O.R.'s, Canterbury, same day, at 12.30.

D. H. JONES, decorator and plumber, Carnarvon First meeting, Crypt Chambers, Chester, April 7th, at 11.30. P.E., Magistrates' Room, Bangor, April 13th, at 12.30.

New Companies.

J. N. KESTELL AND CO., LTD., timber merchants and importers. Capital: £3,000.

PATENT METAL CEMENT, LTD. (Registered in Guernsey). Capital: £16,000.

WATSON AND HILL, LTD., wood turners, Brookfield Mills, Saynor Lane, Hunslet, Leeds. Capital: £1,000.

FREDERICK SAGE & CO. (1905), LTD., shop fitters, &c., 62, Gray's Inn Road, W.C. Capital: £300,000.

FARMER AND BRINDLEY, LTD., sculptors, modellers, &c., 63, Westminster Bridge Road, S.E. Capital: £50,000.

WRIGHT AND SONS, LTD., monumental sculptors and marble masons, 177, Otley Road, Bradford. Capital: £6,000.

CHARLES AND FRANK SMITH AND CO., LTD., dealers in architectural metal-work, locks, hinges, &c. Capital: £2,000.

AIROSTYLE SYNDICATE, LTD., manufacturers of colour spraying apparatus, &c., 35, St. Bride Street, E.C. Capital: £5,000.

KLEANITE CO., LTD., manufacturers of a preparation for cleaning paint and metal known as "Kleanite," and a preparation for preventing the steaming of windows, known as "Frottoline," 56, Ludgate Hill, E.C. Capital: £1,000.

The Restoration of the Dome Colonnade of St. Paul's Cathedral, which has employed a small army of men, is now nearing completion, and in a short time the west front will be taken in hand. Wren made a liberal use of iron bars for the purpose of strengthening his masonry, but they have proved instead a source of weakness. Rusted in some cases completely through, they have given way and thrown strains upon the stonework which it is not able to bear. The iron also seems to cause a more rapid decay of the stone in its vicinity. The sand-blast process has been tried at the cathedral, but owing to the hard surface of the stone it was found to be so slow that it was abandoned.

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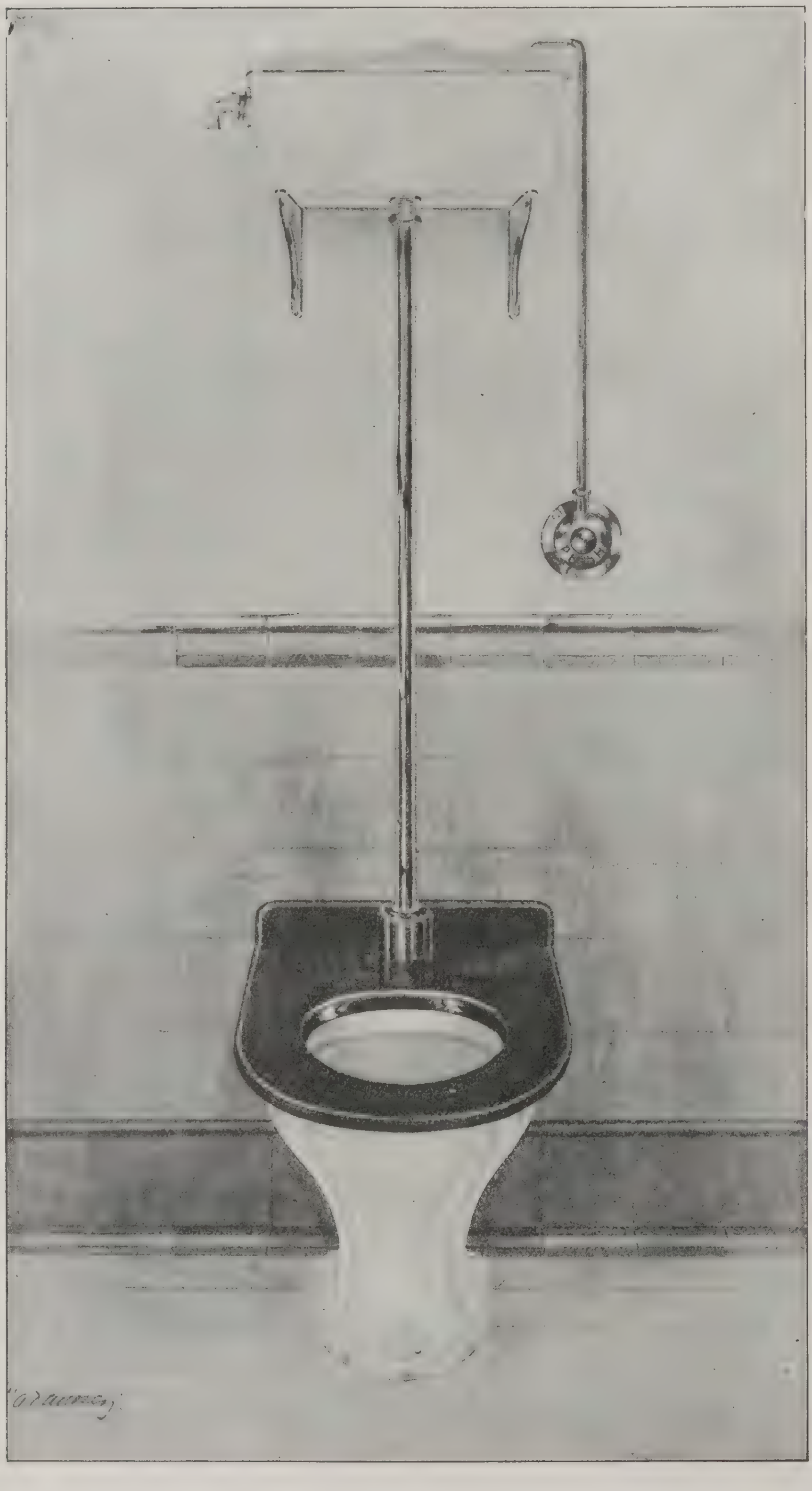

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Northern Architectural Association.—The report for the past session, just issued, gives the membership as 220.

Change of Address. — Messrs. George Elkington & Son, architects and surveyors, have removed to Norfolk House, 7, Laurence Pountney Hill, Cannon Street, E.C.

A Testimonial to Mr. Henry Adams, who is retiring from the professorship of engineering and surveying at the City of London College after thirty-five years' service, is proposed, and all former pupils of his are desired to communicate with Mr. J. L. Crouch, of 29, Basinghall Street, E.C.—the chairman of a committee which has been formed for the purpose.

Street Architecture of To-day.—Mr. Percy Robinson, architect, of Leeds, recently gave a lecture on this subject before the members of the Leeds Arts Club. After reference to the discussion on "Is Leeds Ugly?"—which was started by Mr. George Bernard Shaw, when he recommended them to burn it down—he touched upon the architecture of various towns. The chaotic and capricious nature of our architecture to-day was, he said, largely due to the complex factors of modern life, the varied requirements of the commercial element (which could not be sacrificed for purely artistic considerations), and the many restrictions imposed on all architects. In Leeds particularly the blackness of the buildings was due largely to smoke. He thought, however, that the worst days in that respect had been seen, now that there was an increasing tendency towards the consumption of smoke, the adoption of electricity as a motive power, and the decentralization of factories. Deploring the narrow view taken by municipal authorities in regard to streets, he said he looked upon the Cookridge Street improvement, Leeds, as anything but satisfactory.

Current Market Prices

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0	1	3	0
Clover, best	per load	3	15	0	4	2	6
Hay, good	do.	3	10	0	3	15	0
Sainfoin mixture ...	do.	3	10	0	3	17	6
Straw	do.	1	12	0	2	0	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ...	per cwt.	1	0	5		—	
Colza Oil, English ...	do.	1	2	3		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0		—	
Linseed Oil, barrels ...	per cwt.	0	16	$10\frac{1}{2}$		—	
Petroleum, American ...	per gal.	0	0	$5\frac{5}{8}$		—	
Do. Russian ...	do.	0	0	$4\frac{5}{8}$		—	
Pitch	per barrel	0	8	0		—	
Shellac, orange	per cwt.	7	10	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	4	0		—	
Tar, Stockholm	per barrel	1	6	6		—	
Turpentine	per cwt.	2	2	$4\frac{1}{2}$		—	

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ...	per ton	82	0	0		—	
Iron, Staffs., bar ...	do.	5	17	6	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	0	0	10	5	0
Lead, pig, Soft Foreign...	do.	12	10	0	12	11	3
Do. do. English common brands	do.	12	16	3		—	
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14	0	0		—	
Do. pipe	do.	15	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	5	0		—	
Do. floor brads... ...	do.	9	0	0		—	
Steel, Staffs., Girders and Angles	do.	5	5	0	6	0	0
Do. do. Mild bars ...	do.	6	0	0	6	5	0
Tin, Foreign	do.	138	10	0	139	0	0
Do. English ingots ...	do.	138	0	0	140	0	0
Zinc, sheets, Silesian ...	do.	28	0	0		—	
Do. do. Vielle Montaigne	do.	29	0	0		—	
Do. Spelter	do.	23	15	0	24	2	6

TIMBER.

Soft Woods.

		£	s.	d.	£	s.	d.
Whitewood, American, logs.	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	3	0
Fir, Dantzic and Memel	per load	2	7	6	4	15	0
Pine, Quebec, Yellow ...	do.	4	5	0	7	5	0
Pine, Pitch, American ...	per load	2	8	0	5	15	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, Harnäs (Gefle), Yellow, 4th, 4×11	per std.	9	15	0		—	
Do. Nederkalix, Yellow, 1st, 4×10	do.	11	5	0	12	0	0
Do. do. do. do. 3×9	do.	11	5	0			
Do. do. do. do. $2\frac{1}{2}$×7	do.	10	0	0		—	
Do. Archangel, Yellow, 4th, 3×9	do.	9	0	0			
Do. do. White, 1st, 3×9	do.	9	5	0	11	5	0
Do. do. do. 2nd, 3×9	do.	9	5	0			
Do. Umba, Yellow, 4th, 3×9	do.	9	0	0			
Do. Gothenburg, Yellow, 3rd, 3×9	do.	11	10	0		—	
Do. St. Petersburg, White, 1st, 3×9	do.	9	15	0		—	
Do. do. do. Unsorted, $2\frac{1}{2}$×7	do.	8	5	0		—	
Do. do. Yellow, 1st, $2\frac{1}{2}$×7	do.	9	15	0			
Do. do. do. 1st & 2nd, $2\frac{1}{2}$×11	do.	9	15	0	10	5	0
Do. Kem (White Sea), Yellow, 3rd, 3×9	do.	11	5	0	11	10	0
Do. Narva Yellow, 1st and 2nd, $2\frac{1}{2}$×7	do.	8	5	0		—	
Do. Quebec, Spruce, 2nd, 3×9	do.	9	15	0		—	
Do. do. do. 3rd, 3×9	do.	9	0	0		—	
Do. Montreal, Spruce, 3rd, 3×9	do.	8	10	0	8	15	0
Battens, all kinds ...	do.	6	5	0	13	10	0
Flooring Boards 1in. prepared, 1st... ...	per square	0	9	0	0	10	9
Do. 2nd	do.	0	7	9	0	9	9
Do. 3rd, &c.	do.	0	7	3	0	8	0

Hard Woods.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	4	0	0	7	10	0
Birch, New Brunswick...	do.	2	10	0	5	5	0
Do. Quebec do. ...	do.	2	10	0	6	0	0
Box, Turkey	per ton	7	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	$3\frac{1}{2}$		—	
Do. Honduras ...	do.	0	0	$3\frac{1}{2}$		—	
Do. Tobasco	do.	0	0	$4\frac{25}{32}$		—	
Elm, Quebec	per load	4	2	6	8	15	0
Jarrah, planks	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras...	per ft. sup.	0	0	$3\frac{15}{16}$	0	0	5
Do. African ...	do.	0	0	$2\frac{11}{32}$		—	
Do. St. Domingo	do.	0	0	4		—	
Do. Cuba ...	do.	0	0	$3\frac{1}{2}$			
Do. Lagos ...	do.	0	0	4		—	
Do. Benin ...	do.	0	0	$2\frac{21}{32}$		—	
Do. Tobasco ...	do.	0	0	$5\frac{13}{16}$		—	
Oak, Wainscot	per log.	2	12	6	5	15	0

Complete List of Contracts Open.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		BUILDING:		
April	6	Radcliffe—Registrar's House and Mortuary Chapel ...	Urban District Council	W. L. Rothwell, Council Offices, Radcliffe.
,,	6	Cardiff—Filter- and Meter-house	Corporation...	C. H. Priestley, Town Hall, Cardiff.
,,	6	Middlesbrough—Demolition of Old Buildings	Cemeteries Committee	Robert Marshall, Cemetery Superintendent, Middlesbrough.
,,	6	Southend-on-Sea—School	Education Committee	R. Langton, Clarence Street, Southend.
,,	6	Egremont, Cumberland—Five Houses...	Committee of Lodge of Oddfellows.	J. Cowan, Egremont.
,,	6	Fremington—Alterations to School	——	J. C. Southcombe, Architect, Barnstaple.
,,	6	St. Albans—Station Buildings	Midland Railway Co. ...	Company's Architect, Cavendish House, Derby.
,,	7	Barrow-in-Furness—Removal and Reconstruction of Galleries.	Corporation	Borough Engineer's Office, Barrow-in-Furness.
,,	7	Cwmyglo, Carmarthenshire—Bridge	Rural District Council	J. Saer, 7 Hall Street, Carmarthen.
,,	7	Cymmer, Wales—Extension, &c., of Chapel ...	——	W. Rees, High Street, Cymmer.
,,	7	Manchester—Extension of Washhouse...	Joint Workhouse Committee ...	J. A. Murgatroyd, 23 Strutt Street, Manchester.
,,	7	Merthyr Tydvil—Church	——	Horeb Schoolroom, Merthyr.
,,	7	Milford Haven—Shop	Woodley Co.	Wood & Gaskell, Milford Haven.
,,	7	Whitby—Pair of Villas	Mr. Harrison Baxter	E. H. Smales, 5 Flower Gate, Whitby.
,,	7	Orpington, Kent—Smallpox Hospital	Joint Hospital Board	J. Ladds, 93 Pemberton Road, Harringay, N.
,,	8	St. Merryn, Cornwall—Chapel	——	Rev. W. A. Lawson, The Manse, Padstow.
,,	8	Broomfleet, Yorks—Alterations, &c., to School	Education Committee	Clerk of Works, Beverley.
,,	8	Moretonhampstead, Devon—Residence	——	Rev. Ralph Blake, Bovey Tracey.
,,	10	Padiham, Lancs—Weaving Shed	Albion Room and Power Co. ...	S. Keighley, 27 Nicholas Street, Burnley.
,,	10	Lancaster—School	Education Committee	J. C. Mount, Borough Surveyor, Lancaster.
,,	10	Bedlinog, Wales—Eighteen Houses	——	Mr. Williams, 57 Lower High Street, Bedlinog.
,,	10	Ballywater, Ireland—Alteration to Two Cottages	Lord Dunleath	W. J. Fennell, 2 Wellington Place, Belfast.
,,	10	Stockton—School, &c, ...	Education Committee	T. W. T. Richardson, 50 High Street, Stockton.
,,	10	Tunbridge Wells—Engine-house	Tonbridge R.D.C.	Frank Harris, Engineer to Council, Broadway, Southborough, Tunbridge Wells.
,,	10	Ystalyfera, Wales—One Detached and Two Semi-detached Villas.	——	Glen View, Ystalyfera.
,,	10	Antrim, Ireland—Alterations, &c., to Premises	Mr. James Baird	W. J. Fennell, 2 Wellington Place, Belfast.
,,	10	Ballywater, Ireland—Alterations, &c., to Cottages	Lord Dunleath	W. J. Fennell, 2 Wellington Place, Belfast.
,,	11	Ilford—Extension of School	Education Committee	C. J. Dawson, 11 Cranbrook Road, Ilford.
,,	11	Brentford—Staircase, &c.	Great Western Railway Co. ...	Engineer's Office, Paddington.
,,	11	Bretforton—Fourteen Houses	Great Western Railway Co. ...	Engineer's Office, Winchcombe Station.
,,	11	Mountain Ash, Wales—Waiting Room...	Great Western Railway Co. ...	Engineer's Office, Neath Station.
,,	11	Sketty, Swansea—Seventeen Houses	Co.-op. Building Club	C. T. Ruthen, Bank Chambers, Heathfield Street, Swansea.
,,	12	Elland—Chimney	——	Sharp & Waller, 32 Bradford Road, Brighouse.
,,	12	Aberaman—Three Classrooms, &c.	Urban District Council	J. Morris, Town Clerk, Aberdare.
,,	12	Batley—Bank	——	W. Hanstock & Son, Batley.
,,	13	Longton—Alterations to School	——	Swindells & Rawcliffe, 26 Fishergate, Preston.
,,	14	Preston, Lancs—Fire-station Building	Corporation...	Borough Surveyor, Town Hall, Preston.
,,	14	Llanharan, Wales—Police Station	Joint Committee	County Surveyor's Office, Bridgend.
,,	14	Swindon—School	Education Committee	W. Seaton, Education Office, Town Hall, Swindon.
,,	15	Spennymoor—Police Station	——	County Surveyor's Office, Shire Hall, Durham.
,,	15	Abertaf, Abercynon, Wales—School	Mountain Ash U.D.C.	W. G. Thomas, Public Offices, Mountain Ash.
,,	15	Boston, Lincs—Infirmary, &c.	Guardians	James Rowell, Church Lane, Boston.
,,	15	Denbigh—Asylum Buildings	Visiting Committee	T. M. Lockwood & Sons, Foregate Street, Chester.
,,	15	Epsom—Farm Buildings	Asylums Committee	Acting Clerk of Committee, 6 Waterloo Place, London, S.W.
,,	15	West Hartlepool—Three Houses	Mr. N. B. Kloed	F. E. Boez, York Road, West Hartlepool.
,,	17	Portsmouth—Reinstating Showroom	——	Borough Engineer's Office, Town Hall, Portsmouth.
,,	17	London, N.—School...	Tottenham Education Committee	G. E. T. Lawrence, 22 Buckingham Street, Strand.

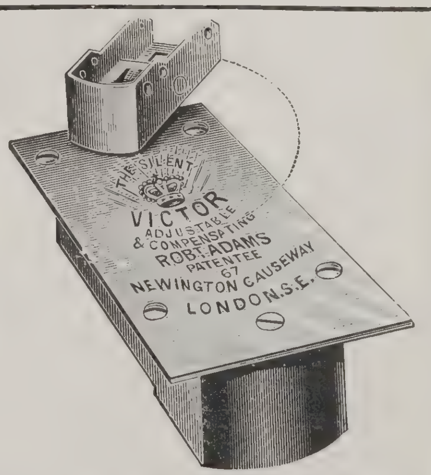
Complete List of Contracts Open.—*continued*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		BUILDING—*cont.*		
April	17	Lewes, Sussex—Offices	East Sussex County Council	County Surveyor's Office, County Hall, Lewes.
,,	18	London, E.C.—Town Hall Restoration	Shoreditch Borough Council	Town Clerk, Town Hall, Old Street, E.C.
,,	18	Pontygwaith, Wales—Fifty Houses	Penrhyn Isaf Building Co., Ltd.	W. D. Morgan, Victoria Chambers, Pentre.
,,	18	St. Bees, Cumberland—Chapel, &c.	—	J. F. Curwen, Architect, Kendal.
,,	18	Ashton-in-Makerfield—Infectious Diseases Hospital Extension.	Urban District Council	Albert Sykes, Clerk to Council, Ashton-in-Makerfield.
,,	26	King's Norton—Library	Urban District Council	A. W. Cross, 23 Valentine Road, King's Heath.
May	1	Rochester—Technical Institute	Corporation	W. Banks, City Surveyor, Rochester.
		ENGINEERING:		
April	6	Arbroath, N.B.—Waterworks	Corporation	Crouch & Hogg, 53 Bothwell Street, Glasgow.
,,	7	Shinfield, near Reading—Rebuilding Bridge	Berks County Council	J. Morris, Broadway Buildings, Reading.
,,	7	Convoy, Ireland—Engine, &c.	Woollen Co., Ltd.	Woollen Co., Ltd., Convoy.
,,	8	Huntingdon—Water Mains	Urban District Council	E. Borissow, Borough Surveyor, Huntingdon.
,,	8	Burnley—Waterworks	Rural District Council	S. Edmondson, 18 Nicholas Street, Burnley.
,,	10	Brighton—Septic Tank Installation	—	Hugho Talbot, Town Hall, Brighton.
,,	10	Glasgow—Electricity Generating Plant	Trustees of Clyde Navigation	T. R. Mackenzie, 16 Robertson Street, Glasgow.
,,	10	St. George's Harbour, Bermuda—Deepening, &c., Channel	Government	Coode & Son & Matthews, 9 Victoria Street, S.W.
,,	11	Bantry, Ireland—Waterworks	Rural District Council	Board Room, R.D C., Bantry.
,,	15	Boston, Lincs—Heating Buildings, &c.	Guardians	J. Rowell, Church Lane, Boston.
,,	18	Llantrisant, Wales—Waterworks, &c.	Rural District Council	G. S. Morgan, School Street, Pontyclun.
,,	18	Mitcham, Surrey—Gasholder	District Gaslight Co.	Company's Works, Mitcham.
,,	19	Aberdeen—Condenser	Electricity Department	J. A. Bell, Corporation Electricity Works, Millburn Street, Aberdeen.
,,	19	Merthyr Tydvil—Waterworks	Urban District Council	G. F. Deacon, 16 Great George Street, Westminster, S.W.
May	1	Suakin (Red Sea)—Lighthouse	Ports and Lights Administration	Deputy-Controller-General, Ports and Lights Administration, Alexandria.
,,	8	Bishop's Stortford—Boilers, &c.	Urban District Council	T. Swatheridge, 7 North Street, Bishop's Stortford.
,,	30	Sydney, New South Wales—Refuse Destructor	Municipal Council	Acting Agent-General for State of New South Wales, Victoria St., S.W.
		IRON AND STEEL:		
April	6	Failsworth, Lancs—Ironwork	Urban District Council	G. F. Gray, Council Offices, Failsworth.
,,	7	London, S.E.—Fencing	London County Council	Park's Department, 11 Regent Street, S.W.
,,	11	Leith, N.B.—Iron	Harbour Commissioners	Superintendent's Office, Tower Place, Leith.
,,	15	Prestwich—Iron Manhole Covers, &c.	Urban District Council	W. Nuttall, Chester Bank, Prestwich.
,,	15	Glasgow—Pipes	Corporation	J. R. Sutherland, 45 John Street, Glasgow.
,,	17	Wigan—Wrought-iron Tube, &c.	Gas Committee	J. Timmins, Gasworks, Wigan.
,,	18	Castlecomer, Ireland—Cistern	Guardians	Workhouse, Castlecomer.
,,	31	Manchester—Pipes	Waterworks Committee	Secretary, Waterworks Office, Town Hall, Manchester.
Sept.	1	Sydney, Australia—Iron and Steel	—	Agent-General's Office, 9 Victoria Street, S.W.
		PAINTING AND PLUMBING:		
April	8	Chester—Painting Work	Corporation	Electrical Engineer Electricity Works, New Crane Street, Chester.
,,	8	Walkden, Lancs—Oils, &c.	Worsley U.D.C.	J. A. Carson, District Offices, Hilton Lane, Walkden.
,,	10	Cardigan—Painting Garden Seats, &c.	Corporation	D. M. Jones Town Clerk, Cardigan.
,,	13	Doncaster—Painting and Decorating Chapel	Trustees	Councillor Theobald, Red House, Doncaster.
,,	13	London, S.E.—Painting Interior & Exterior of Workhouse	Guardians	E. P. Fenton, 283 Tooley Street, S.E.
,,	13	Halifax—Painting Interior of Town Hall	Finance Committee	J. Lord, Town Hall, Halifax.
,,	15	Prestwich—Paints, &c.	Urban District Council	W. Nuttall, Chester Bank, Prestwich.
,,	17	Leeds—Painting at Parks, &c.	—	City Engineer's Office, Leeds.
,,	17	Stafford—Painting at Cottages	Corporation	W. Blackshaw, Borough Hall, Stafford.
		ROADS AND CARTAGE:		
April	6	Southend-on-Sea—Road Works	Corporation	E. J. Elford, Borough Surveyor, Southend-on-Sea.
,,	6	Whiston, Lancs—Road Materials	Rural District Council	R. J. Knapman, Delph Lane Offices, Whiston
,,	7	Liversedge, Yorks—Granite Setts	Urban District Council	F. Langley, Council Offices, Liversedge.
,,	7	Whickham, Durham—Road Materials	Urban District Council	T. Lambert, Town Hall, Gateshead.
,,	7	Cheadle—Road Materials	Urban District Council	E. Sykes, Surveyor to Council, Cheadle.
,,	8	Walkden, Lancs—Road Materials	Urban District Council	J. A. Carson, District Offices, Hilton Lane, Walkden.
,,	10	Jarrow—Street Works	Urban Sanitary Authority	Borough Surveyor's Office, Town Hall, Grange Road, Jarrow.
,,	10	Dover—Road Materials	Town Council	Sir Wollaston Knocker, Castle Hill House, Dover.
,,	10	Uttoxeter—Road Materials	Rural District Council	J. Preston, Woodlands, Uttoxeter.

PERFECTION
IN
Spring Hinges

The "VICTOR" Double Action Spring Hinges open wider than any other—viz., 135° each way, *i.e.*, 45° beyond right angles—and close with a perfect check action.

ROBERT ADAMS,
PATENTEE,
3 & 5, Emerald Street,
Theobald's Road, W.C.
Telegrams: "ROBERT ADAMS, LONDON."



The "Crown Victor" showing opening capacity.

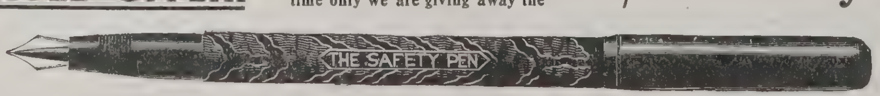
Guaranteed
THE BEST
Spring Hinges
In the world.

The "VICTOR" Single Action Spring Hinges open wider than any other—opening to and closing from the angle of 180°, *i.e.*, the half circle, with a perfect check action.

ROBERT ADAMS,
PATENTEE,
3 & 5, Emerald Street,
Theobald's Road W.C.
Telephone: 829 Central.

UNPRECEDENTED OFFER. As an advertisement, for a short time only we are giving away the 10/6 "Safety Pen" for 2/6

A great improvement upon all other Fountain Pens.



Latest Improved Twin Feed.

Unequalled for its Beauty—Smoothness in Writing—Regular Feeding in Ink—Easy to Fill—Easy to Handle—Easy to Write.
Sample Pens, 2/6; Usual Retail Price, 10/6. The 21/- Pen, Handsome Gold Mounted, for 5/-
Makers: E. NEWTON & Co., 63, Aldermanbury, London, E.C.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		ROADS AND CARTAGE—*cont.*		
April	10	Stirchley, near Birmingham—Street Works	Urban District Council	A W. Cross, 23 Valentine Road, King's Heath, Birmingham.
,,	10	St. Mellon's, near Newport—Road Metalling	Rural District Council	Union Offices, Queen's Hill, Newport, Mon.
,,	10	Chelmsford—Granite	Guardians	W. W. Duffield, 96 High Street, Chelmsford.
,,	10	Magor, Wales—Metalling	Rural District Council	Union Offices, Queen's Hill, Newport, Mon.
,,	11	Crewe—Road Works	Town Council	G. E. Shore, Borough Surveyor, Crewe.
,,	12	Ashford, Kent—Road Materials	Rural District Council	A. Sims, Surveyor, Charing.
,,	12	Radstock, Somerset—Road Materials	Urban District Council	G. H. Gibson, Radstock, Bath.
,,	12	Uckfield, Sussex—Road Materials	Rural District Council	F. Holman, 86 High Street, Lewes.
,,	12	Hoylake, Cheshire—Macadam, &c.	Urban District Council	Engineer to Council, Town Hall, Hoylake.
,,	13	Helmsley, Yorks—Stone	Rural District Council	R. Pearson, Clerk, Helmsley.
,,	15	Prestwich—Road Materials	Urban District Council	W. Nuttall, Chester Bank, Prestwich.
,,	15	Tenterden, Kent—Road Materials	Corporation	W. L. C. Turner, Town Hall, Tenterden.
,,	20	Oakham—Road Materials	Rutland C.C.	B. A. Adam, Clerk, Oakham.
,,	20	Houghton-le-Spring, Durham—Road Materials	Rural District Council	D. Balfour, Houghton-le-Spring.
		SANITARY:		
April	8	Dewsbury Disinfectants	Corporation	H. Ellis, Town Hall, Dewsbury.
,,	8	Saffron Walden, Essex—Repairing Drain	Rural District Council	A. Pitslow, Sanitary Inspector, Saffron Walden.
,,	10	Norton, Sheffield—Emptying Ashpits	Rural District Council	T. Smith, Clerk, The Edge, Sheffield.
,,	10	Dore and Totley, near Sheffield—Emptying Ashpits	Rural District Council	T. Smith, The Edge, Sheffield.
,,	10	Tunbridge Wells—Sewerage Works	Tonbridge R.D.C	F. Harris, Broadway, Southborough, Tunbridge Wells
,,	10	Gelligaer, Wales—Sewer Extension	Rural District Council	Council Offices, Hengoed.
,,	10	Glasgow—Sewer	Corporation	City Engineer, 64 Cochrane Street, Glasgow.
,,	11	London, N.—Stoneware Pipes	Edmonton U.D.C.	G. E. Eachus, Town Hall, Edmonton.
,,	11	Ponteland, Northumberland—Sewers	Castle Ward R.D.C.	J. Jameson, Sanitary Surveyor, Ponteland.
,,	12	St. Austell, Cornwall—Drain Pipes	Rural District Council	A. J. Blight, Trelowth Street, St. Austell.
,,	15	Prestwich—Disinfectants	Urban District Council	W. Nuttall, Chester Bank, Prestwich.
No date		Ulverston—Sewerage Works	Rural Disrrict Council	Engineer, Town Hall, Ulverston.
		TIMBER:		
April	11	Leith, N.B.—Timber	Harbour and Docks Commissioners.	Superintendent's Office, Town Place, Leith.

List of Competitions Open.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
April	14	Swindon—School	£5 per cent.	——	W. Seaton, Education Office, Town Hall, Swindon.
,,	17	Cardiff—Libraries	£75 & £50	——	Chief Librarian, Central Libraries, Cardiff.
,,	29	Radcliffe, Lancs—Library, &c.	£50, £30 & £20	£1 1s.	S. Mills, Council Offices, Radcliffe, Manchester.
May	1	Ilford—Design for Adhesive Stamp for Hospital Committee.	——	£2 2s.	Wright & Sons, 31 Cranbrook Road, Ilford.
,,	15	Rochester—Institute	£50, £21 & £10 10s.	——	W. Banks, City Surveyor, Rochester.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

The Latest Production.

A PERFECT ENAMEL PAINT
FOR PRACTICAL WORK,
BY PRACTICAL USERS.

"SANALENE"

ONE GALLON COVERS FROM
60 TO 70 SQUARE YARDS
ON A PREPARED SURFACE.

"SANALENE"

Registered Trade Mark.

FLOWS FREELY.
HARD WEARING.
EASILY WASHED & POLISHED.

BLUE LABEL FOR INSIDE.
DRIES IN ABOUT 8-10 HOURS.
GRADUALLY HARDENS.

RED LABEL FOR OUTSIDE.
DRIES IN ABOUT 15 HOURS,
ACCORDING TO WEATHER.

ASPINALL'S ENAMEL, LTD.,
NEW CROSS,
LONDON, S.E.

Advertising Notes.

> *"Every wise man knows his own business better than a mere outsider, but the art of presenting business facts and reasons in an interesting and convincing manner is the essential of result-getting advertising. Often an outsider can do this better than the wise man.*
> *The best advertising is done from the reader's side of the fence."*

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterward, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Monday.

A LADY TYPIST SHORTHAND WRITER, 26 (Pitman's Metropolitan School), desires RE-ENGAGEMENT in London office. London experience; excellent refs. Salary moderate.—Box 1031, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT and SURVEYOR'S ASSISTANT desires ENGAGEMENT (London or South preferred), seven years' experience in all branches. Working and detail drawings. Surveying and levelling. Good knowledge of quantities. Excellent testimonials and references.—F. R. E. B., Battenberg, Malton, Yorkshire. 1026

ARCHITECT and SURVEYOR'S competent ASSISTANT disengaged; 20 years' practical experience, London and provinces. Good draughtsman, working and detail drawings, specifications, surveying, levelling, &c.—24, Lebanon Road, Croydon. 1047

ARCHITECT and SURVEYOR'S JUNIOR ASSISTANT desires RE-ENGAGEMENT; 3½ years' experience. Knowledge of construction and levelling.—Apply A. B., 48, Thornton Avenue, Chiswick, W. 1029

ARCHITECT'S ASSISTANT, aged 26, 9 years' London and provincial experience; designs, working drawings, quantities, and perspectives, &c.—A. S. R., 100, Crompton Road, Handsworth, Birmingham. 1016

ARCHITECT'S ASSISTANT (24) desires situation; contract drawings; details, &c.; surveying, assistance with quantities; good experience. —Box 1040, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S ASSISTANT desires engagement. Working Drawings, Details, Specifications, and assist with Quantities. Honours: Building Constructon. 6½ years' reference.—P. R., 2, Malvern Road, Thornton Heath, S.E.

ARCHITECT, C.E., and SURVEYOR'S ENGAGEMENT REQUIRED. Applicant has twelve years' experience; apprenticeship five years. Had Government appointment. Practised privately. Good references and testimonials.—Reply to Scottie, Box 1055, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S or CONTRACTOR'S ASSISTANT. Six years' experience. Neat draughtsman. Practical knowledge construction, levelling, surveying, drainage, &c. Shorthand, typewriting, specifications, measuring up. Moderate salary.—Arnold, 30, London Road, Dover. 1038

ARCHITECT'S JUNIOR ASSISTANT desires ENGAGEMENT in a good London Office, 4½ years' experience; age 23; good references; salary moderate.—B. E. Atkinson, Junr., 14, Rosslyn Hill, Hampstead, N.W. 1005

ARCHITECT'S JUNIOR ASSISTANT (22) requires engagement in London. Salary, 25s. Working or detail drawings, measuring old work, knowledge of surveying, &c. Good refs.—E. J. C., Beaconsfield, Kew Green, Surrey. 1025

ARCHITECT'S JUNIOR ASSISTANT (20) seeks Sit. in Architect's Office. Good draughtsman, office routine, details from sketches, &c. Good refs. Mod. sal.—Box 1012, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

BUILDER AND DECORATOR'S ASSISTANT (25) seeks re-engagement; six years' experience in a West End business; contract and jobbing; used to management of men; excellent reference.—Gay, 39, Lanark Villas, Maida Vale, W. 1030

BUILDER'S ASSISTANT (26) desires immediate Engagement. Prime cost, accounts, or estimating for and supervising decorative and jobbing work. Excellent references. Moderate salary.—S., 10, Coulsdon Road, Coulsdon, Surrey. 1007

BUILDER'S CLERK seeks RE-ENGAGEMENT, owing to illness of last employer. Prime cost, accounts, quantities, assistance at estimating, &c. Sixteen years in last situation.—S. E., 183, The Grove, Hammersmith, W. 1036

BUILDER'S CLERK seeks RE-ENGAGEMENT. Time-sheets, accounts, and usual office routine.—A. G., 56, Stratford Road, Kensington, W. 1050

BUILDER'S SON (30) requires ENGAGEMENT with good firm for Material, Timekeeper, or Yard Foreman. Six years last firm. Accustomed to large jobs.—G. U., 6, Marriott Road, Tollington Park, London, N. 1014

CARPENTER and JOINER (25) wants JOB. London or suburbs. Bench, fixing, or estate. Three years' references. Moderate wage. Abstainer.—Joiner, 123A, Princess Street, Edgware Road, W. 1049

CARPENTER and JOINER (28), with two years' experience as general foreman, wants JOB. Time-keeping, good manager of men. Well up in plans, &c. Three building certificates, S.K. Abstainer. Good references.—Address E. S., 26, Houblon Road, Richmond, S.W. 1051

CLERK desires EMPLOYMENT with Architect or Contractor. Drawing, quantities, &c., and general routine; seven years last situation.—Address P., 53, Cambridge Street, S.W. 1027

FIRST-CLASS CARPENTER & JOINER desires SITUATION. Stairs, handrailing, shop and office fitting.—C. W. Fletcher, 115, Clifford Gardens, Kensal Rise, London, N.W. 1034

FOREMAN of PAINTERS and DECORATORS. Twenty-five years' experience in all classes of work. Good manager, decorator, and colourist. First-class references.—W. P., Poplar Cottage, 28, Haven Green, Ealing, London, W. 1046

GENERAL FOREMAN, age 40, seeks re-engagement. Trade Bricklayer, well up in all branches. Abstainer.—Address 16, Chelmsford Road, Walthamstow, Essex. 1043

GENERAL FOREMAN, practical and reliable carpenter, good manager and draughtsman, well up in plans and details. Country preferred. Age 52.—G. L., 68, South Terrace, Littlehampton. 1008

MACHINIST wants JOB. Works spindle, general joiner, four-cutter, overhand, and general all-round hand. Grind, makes own tools, understands gas engine, do own repairs.—W. Hamlyn, 42, Elswick Road, Lewisham, S.E. 1010

PRACTICAL ENGINEER and Erector of Bridges, Roof and Constructional Steelwork, is open to contract for same, finding all plant, tools, tackle, &c.—F. D., 20, Homestead Road, Fulham. 1028

SHOP or GENERAL FOREMAN requires engagement, used to machinery. Good manager of men; 4 years last job. Qualifications with references. —C., 2, Thurlow Terrace, Maitland Park, N.W. 1042

SHOP FOREMAN of JOINERS seeks RE-ENGAGEMENT. First-class experience in all kinds of cabinet and general joinery. Good manager of men and machinery. Quick and accurate setter out. London experience. Abstainer. First-class references. Town or Country.—R. W. B., 49, Nigel Road, Peckham, S.E. 1015

STEADY, QUALIFIED CLERK-OF-WORKS desires re-engagement. Rural, Urban, Church, School, Mills Business; Drainage, Sanitary, Concrete, Structural Steel, Pilings Works.—Box 1054, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

WANTED IMMEDIATELY, by Young Man with 6½ years' experience in Building Trade, post as ASSISTANT to Surveyor and Sanitary Inspector.—W., 20, Bell Street, Henley-on-Thames. 1044

YOUNG MAN, age 21, wishes to learn PLUMBING. Served his time as painter and grainer. Small wage required.—Apply H. B., 4, Virginia Terrace, Maxton, Dover. 1039

Appointments Vacant.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterward, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Monday.

GOOD all-round ASSISTANT required; small country practice.—Apply, with particulars and terms, Ball and Heaton, Architects, Hinckley.

WANTED, BUILDER'S ASSISTANT. Prime cost, ledgers, abstracting, billing up, quantities, general routine.—Box 1056, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

Partnerships.

PERSPECTIVES.—Advertiser, of artistic and business abilities, would like correspondence with view to PARTNERSHIP.—Reply, in confidence, to H., Box 680, Smith's Advertising Agency, 100, Fleet Street, E.C. 1033

Drawings, Tracings &c.

JUNIOR (20) seeks SITUATION as TRACER, &c., in Drawing Office of Engineers; 5½ years with large city firm. Good references.—Box 1045 Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

PLANS, SPECIFICATIONS and ESTIMATES prepared. Drawings and tracings executed. Personal attention given to every client.—R. A. H., 50, Carnarvon Road, Stratford, Essex. 1035

Offices &c. Wanted & To Let.

SHARE OF OFFICES.—An Architect with offices adjoining Bedford Row can accommodate another. Terms £18.—Box 995, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

TO ARCHITECTS.—Whole or partial use of well-lighted OFFICE TO LET in modern building (Bedford Row). Telephone and electric light. Moderate inclusive rent.—Box 1023, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

Businesses Wanted & For Sale.

ARCHITECT and SURVEYOR wishes to dispose of his Business. Very efficiently fitted, including typewriter. Main road S.W. district. Owner going abroad. Very fine opening for energetic young architect. £50 inclusive.—Apply Box 1041, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

Miscellaneous.

LIFTS.—WM. AUG.'S GIBSON, Ltd., formerly President of American Elevator Co., later Managing Director Otis Elevator Co., Ltd. Temple Bar House, 28, Fleet Street, London, E.C.

ALABASTER WORK. Fine blocks now in cut.—Alfd. S. Tucker, 143½, Euston Road, N.W.

BACK numbers of Builders' Journal for Sale, price 1½d. each post free.—Box 1053, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

FOR SALE, a small fully-equipped up-to-date Constructional Steelworks, London, waterside premises, all new modern electrical machinery, perfect condition, as a going concern, capacity about 2,000 tons finished work per year, can be seen in working order, or machinery can be moved.—Box 1057, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

FRENCH POLISHERS to the trade in all its branches. PIECEWORK wanted. Best workmanship guaranteed. Terms moderate. Estimates free. —Lewis & Lane, 1, New Street Cottages, Vauxhall Bridge Road, Pimlico, S.W.

MARBLE AND GRANITE WORK. Speciality, Shopfittings, Steps, and Monuments.—Kelly & Co., Masons, Mill Hill, N.W., also Kilburn, N.W., and Harpenden, &c. Telephone, 1159 Hampstead.

POLING BOARDS, selected lengths and thicknesses (best quality and full measure).
Also Scaffold Boards, Putlogs, Scantlings, Deals, Battens, and Boards. Lowest wharf prices.
C. H. GLOVER & Co., Ltd., Importers, Hatcham Saw Mills, Old Kent Road, S.E.

RE-DECORATION of large school premises required. Advertiser would receive boy (or boys) as boarder per contra. Thoroughly good school, S.W. suburb.—Box 1032, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

TO FLAT AND VILLA BUILDERS.—Special cheap line in internal fire resisting partitions; room saving and sound proof.—Address, Partitions, 60, Watling Street, London, E.C.

TYPEWRITING.—Specifications, &c., accurately typewritten in triplicate, 1½d. folio (72 words), paper included.—Judge, jun., 27, Lordsmead Road, Tottenham, N. 1059

WANTED—BUILDERS to send for prices of Joinery, Carcassing and General Woodwork. Special Quotations for large orders of Sashes, Frames, and Stairs.—Reid, 91, Mill Hill Road, Acton. 1058

SEE PAGES XVII and XXII FOR EMPLOYMENT REGISTER.

WORKING or COMPETITION DRAWINGS, PERSPECTIVES, TRACINGS,
PHOTO-COPIES, All kinds of copies, including PERMANENT BLACK LINE on CARTRIDGE or LINEN. **MODELS** OF BUILDINGS, WORKS, ETC., **LITHO-PRINTING.**
THE LONDON DRAWING & TRACING OFFICE, (Estd. 1883.) **98, Gray's Inn Road, W.C.** (Adjoining Holborn Town Hall.)
Telephone, No. 1011 HOLBORN. *Manager*—**JOHN B. THORP.** Telegrams: "DIVIDITORE," LONDON.

Educational.

R.I.B.A. EXAMS.—Personal and Correspondence tuition; courses of any duration. Apply for syllabus to Mr. A. G. BOND, B.A. Oxon., A.R.I.B.A., 115, Gower Street, London, W.C. (late Howgate and Bond).

QUANTITIES.—A course of Correspondence Lectures in this subject (on the London system) is now ready. Also Lectures in Estimating. For particulars apply Box 632, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

R.I.B.A., AND ALL TECHNICAL EXAMINATIONS.—Preparation by Correspondence or personally. First place on 29 occasions in open competition.—G. A. T. MIDDLETON, 19, Craven Street, Strand, W.C.

PRACTICAL DESIGNING OF STEEL CONSTRUCTIONAL WORK taught by Correspondence, individually or in classes. Elementary and advanced courses arranged for Architects, Engineers, &c. Write for particulars to the EMBANKMENT ENGINEERING INSTITUTE, 156, Temple Chambers, Temple Avenue, E.C.

STRUCTURAL STEELWORK
Can you design a girder or stanchion properly? We can show you how to do so in the quickest and safest way known without the use of obscure mathematics. Our system of CORRESPONDENCE TUITION in Engineering Subjects is endorsed by the Press and Leading Engineers everywhere. Write us for free Booklet and see what they say.—THE MIDLAND ENGINEERING BUREAU, STRAND, DERBY.

THE SOCIETY OF ARCHITECTS.

FOUNDED 1884. INCORPORATED 1893.

Telegrams: "Crypt, London." Telephone: 1852, Holborn.

An EXAMINATION to qualify for MEMBERSHIP will be held on April 18th, 19th, and 20th, 1905, in LONDON and MANCHESTER.

SYLLABUS on application to the SECRETARY, at Staple Inn Buildings, Holborn, W.C.

THE ARCHITECTURAL ASSOCIATION.

April 7th. Special General Meeting, 18, Tufton Street, Westminster, S.W., 7.15 p.m. To discuss the proposal to substitute the word "Council" for "Committee" wherever it occurs in the Constitution and Bye-laws.

April 7th. Ordinary General Meeting, 18, Tufton Street, Westminster, S.W., 7.30 p.m. Paper by Mr. H. PHILLIPS FLETCHER, F.R.I.B.A., on "The Buildings of the World's Fair at St. Louis, 1904," illustrated by lantern views. Election of Officers for Session 1905-1906.

April 8th. Sixth spring visit to Æolian Hall, New Bond Street, by kind permission of the Architect, Mr. WALTER CAVE. Members to meet at the building at 2 p.m. A visit will afterwards be paid to No. 2, Hamilton Place, Park Lane, W., by kind permission of the Architects, Messrs. ROMAINE-WALKER and BESANT. Members to meet at 3.30 p.m.

LOUIS AMBLER
HENRY TANNER, Jr. } Hon. Secs.

EMPLOYMENT REGISTER.

Too late for Classification.

1049.—CARPENTER AND JOINER (25). London or suburbs; bench, fixing, or estate; 3 yrs. refs., mod. s.; abstainer.

1050.—BUILDER'S CLERK (26). Time-sheets, accounts and usual office routine.

1051.—CARPENTER AND JOINER (28). 2 yrs. exp. as General Foreman; Timekeeper and good Manager; plans, &c.; 3 bldg. certifs. S.K.; abstainer; good refs.

1055.—ARCHITECT, C.E. AND SURVEYOR; 12 yrs. exp.; 5 yrs. apprenticeship and Govt. appt., and private practice; good refs.

1058.—JOINERY, CARCASSING, AND GENERAL WOODWORK. Special quotations for large orders, sashes, frames, and stairs.

1059.—TYPEWRITING; Specifications, &c., written in triplicate; very low prices.

1060.—FRENCH POLISHING. Piecework wanted; best workmanship, mod. terms, estimates free.

See p. xxii for the Employment Register.

Contracts Open.

URBAN DISTRICT of ERITH.

ERECTION OF PUBLIC LIBRARY.
TO BUILDERS AND CONTRACTORS.

The Erith Urban District Council invite TENDERS for the ERECTION of PUBLIC LIBRARY BUILDING at Erith.

Copies of the bills of quantities and general conditions, with form of Tender, may be obtained of Mr. W. EGERTON, Architect, 12, Queen's Road, Erith, upon depositing the sum of two guineas, which sum will be returned upon receipt of a bonâ-fide Tender.

The Contractor will be required to enter into a contract and bond, with two sureties, for the due performance of the contract, and the contract will contain provisions that the Contractor shall pay all workmen not less than the standard rates of wages, and observe the conditions of labour customary in the district where the work is executed, also that he shall not assign or sub-let the whole or any part of the contract without the previous written consent of the Council.

Tenders, sealed and marked "Tender for Public Library," to be addressed to the undersigned, and delivered not later than FOUR p.m. on MONDAY, the 17th day of APRIL, 1905.

Dated this 28th day of March, 1905.

CHARLES H. FRY,
District Council Offices, Clerk of the Council
Bexley Road,
Erith.

BROMLEY and BECKENHAM JOINT HOSPITAL BOARD.

SMALL-POX HOSPITAL, ORPINGTON, KENT.

The Bromley and Beckenham Joint Hospital Board are prepared to receive TENDERS for the ERECTION of a SMALL-POX HOSPITAL, in Crotton Heath Wood, in the Parish of Orpington, Kent, in accordance with plans and specifications prepared by their Architect, Mr. JOHN LADDS, of 93, Pemberton Road, Harringay, London, N.

Application for quantities to be made in writing to the Architect not later than 25th MARCH, enclosing a Bank of England five-pound note, as deposit for a copy of the quantities, which will be returned on receipt of a bonâ-fide Tender.

Due notice to the applicants will be given where and when the plans can be seen.

Tenders, endorsed "Tenders for Small-pox Hospital," to be delivered to the undersigned at Park House, Bromley, Kent, on or before THREE o'clock on FRIDAY, the 7th APRIL next.

The lowest or any Tender will not necessarily be accepted.

(Signed) FRANK H. GEDNEY,
Office of the Board, Clerk to the said Board.
Park House, Bromley.

EAST SUSSEX COUNTY COUNCIL.

TO BUILDERS.

TENDERS are invited for the ERECTION of the proposed new OFFICES in Fisher Street, Lewes, for the Education Department.

Plans, specification, and conditions of Contract can be seen at the COUNTY SURVEYOR'S Office, County Hall, Lewes, after FRIDAY, 31st MARCH next, between the hours of TEN a.m. and FOUR p.m.; Saturdays, Ten a.m. and One p.m.

Bills of Quantities may be obtained after FRIDAY, 31st MARCH, on application to Mr. F. J. WOOD, County Surveyor, Lewes, on payment of a deposit of three guineas, which deposit will be returned upon the receipt of a bonâ-fide Tender.

The Contractor whose Tender is accepted will be required to enter into a Contract with the County Council, and, if required, enter into a bond with two approved sureties for the due currying out of the contract.

Tenders, endorsed "Tender for New Education Offices," to be addressed and delivered to F. MERRIFIELD, Esq., County Hall, Lewes, not later than TEN a.m. on MONDAY, 17th APRIL, 1905.

The County Council does not bind itself to accept the lowest or any Tenders, and will not pay any expenses in connection with the preparation thereof.

FRED J. WOOD, M.S.A.,
County Hall, Lewes. County Surveyor.
March 6th, 1905.

To Contributors.

THE EDITOR will be pleased to consider any articles illustrated or otherwise, dealing with old and new buildings, methods of construction, or other matter of an architectural character. He will also be glad to consider architectural photographs and sketches (the latter preferably in black and white) and measured drawings of work in this country or abroad. News items of interest to architects and builders will also be considered, provided the name and address of the sender are given; no notice will be taken of anonymous contributions. All communications should be addressed to the Editor of THE BUILDERS' JOURNAL, 6, Great New Street, E.C.

Privileges open to all Regular Readers of the "Builders' Journal."

I.—Free Monthly Advertisements.

1. A Free Advertisement of 12 words in the Wanted or Miscellaneous Advertisement Columns, in one issue of the BUILDERS' JOURNAL during each calendar month will be given to any regular reader.

2. The charge of one penny will be made for each additional word.

3. Advertiser's Name and Address or Box Number must be counted, but will in no case be reckoned as more than five words.

4. All advertisements must be accompanied by the correct remittance, and should a receipt be required a stamped addressed envelope must be enclosed.

5. The Proprietors reserve to themselves the right of refusing any advertisement.

II.—Free Answers to Enquiries.

1. The services of a large staff of experts are at the disposal of all regular readers who require information on architectural, constructional or legal matters.

2. Questions should in all cases be addressed to the Editor, and be written on one side of the paper only.

3. Correspondents are particularly requested to be as brief as possible.

4. The querist's name and address must always be given, not necessarily for publication

Note.—Owing to the large number of enquiries we receive weekly, we are compelled to restrict the advantages of this department to Regular Readers.

III.—Free Accident Insurance of £500.

1. Every regular reader of the BUILDERS' JOURNAL is entitled to the benefit of this Insurance.

2. A Pamphlet giving full details of this and other Insurance schemes inaugurated by the BUILDERS' JOURNAL for the benefit of its readers, and guaranteed by "The Ocean Accident Corporation, Limited," will be sent on application.

What is a Regular Reader?

We have employed the term "Regular Reader" throughout these announcements as the description "subscriber" is often understood to mean one who subscribes direct to the publishing office.

We mean by a Regular Reader anyone who has placed an order with us or any newsagent or bookstall for the BUILDERS' JOURNAL for one year.

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5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS.
OFFICE: 6, GREAT NEW STREET, FETTER LANE, E.C.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Bournemouth.—For the erection of a chapel and vestries at Winton, for the Primitive Methodist Connexion. Mr. T. E. Grimes, architect, 71, Talbot Road, Bournemouth :—

G. Shears & Sons	£1,948	10	0
S. Brown & Sons	1,794	13	0
T. Dean, Winton	1,720	0	0
Drake	1,716	10	0
Burt & Cherritt, Winton	1,705	18	0
Jones & Seward	1,649	0	0
A. J. Colborne, Swindon	1,619	8	0
E. H. Crabb,* Poole Road, Parkstone	1,450	0	0

* Accepted. [Rest of Bournemouth.]

Kirkcaldy.—For an extension of about 500ft. to the East Pier (about 23,000 cub. yds. of concrete), for the Town Council :—

Tilbury Contracting Co., London	£52,236	17	6
G. & R. Cousin, Edinburgh	51,729	17	0
Kinnear, Moodie & Co., Edinburgh	48,548	0	0
Pearson & Son, Ltd., Seaham Harbour, co. Down	48,243	0	0
G. Lawson, Rutherglen	40,629	18	0
Robertson & MacPherson, Dundee	40,337	8	0
W. Hill & Co., London	38,959	0	0
G. Smith & Sons, Kirkcaldy	38,777	19	8
W. Beattie & Sons, Edinburgh	36,499	0	0
Sir J. Jackson, Ltd., London	35,110	0	0
Muirhead, Greig & Matthews, London	34,840	0	0
J. Best, Edinburgh	32,562	19	0
R. C. Crawford, Strathaven	31,143	0	0
R. McAlpine, Glasgow	29,797	0	0
Kirkwood, Kerr & Co., Glasgow	28,202	0	0
Blair & Whyte, Glasgow	27,858	16	6
C. Brand & Son,* 65, Renfield Street, Glasgow	25,991	19	7
W. Petrie & Co., Grangemouth	24,415	17	4

* Accepted.

Llandaff.—For the first section of St. Michael's Theological College, for the Council of the College. Mr. F. R. Kempson, F.R.I.B.A., architect, Hereford and Cardiff. Quantities by Mr. Charles Taylor, Cardiff :—

T. Broad & Co., Malvern	£11,005	0	0
Stephens & Bastow, Bristol	10,997	0	0
D. Davies, Cardiff	10,973	0	0
S. Shepton & Son, Cardiff	9,945	0	0
E. Estcourt & Sons, Gloucester	9,800	0	0
W. Thomas & Co., Cardiff	9,633	0	0
Willcock & Co., Wolverhampton	9,411	0	0
W. Bowers & Co., Hereford	9,350	0	0
W. A. Linton, Newport	9,300	0	0
Turner & Sons, Cardiff	8,895	0	0
Knox & Wells, Cardiff	8,885	0	0
F. Bevan, Penarth	8,800	0	0
J. Allan & Co., Woodville Road, Cardiff	8,601	0	3

London.—For the construction of new piers at Millwall and Hammersmith, and the partial reconstruction of the piers at Putney and Wandsworth, for the London County Council :—

Thames Ironworks, Shipbuilding and Engineering Co., Ltd.	£23,254	12	8
A. Fasey & Son	15,529	13	8
Page, Son & East, Ltd.	14,840	17	6
J. Cochrane & Sons	14,307	7	2
Westminster Construction Co., Ltd.*	13,823	10	10
J. R. Piper (Millwall pier only)	5,179	9	1

* Accepted.

Preston.—Accepted for the erection of a fever hospital at Holme Slack, for the Corporation :—

T. & R. Colley, Preston	£19,382

Sanderstead (Surrey).—For the erection of two pairs of semi-detached houses in Beechwood Road, for Mr. A. D. MacRae. Messrs. Pepler & Allen, architects, 3, George Street, Croydon :—

J. R. Bex	£3,400
Grace & Marsh	2,859
W. Potter	2,770
Worsfold & Sons*	2,640

* Accepted.

Sleaford (Lincs).—For the erection of two pairs of cottages at Rauceby Asylum, for the Committee of Kesteven County Asylum. Mr. Jesse Clare, county architect, Sleaford :—

Newton & Cooke	£1,548	9	0
H. Rose & Son	1,401	1	3
T. C. Armstrong, Horbling, Falkingham	1,375	5	8
W. J. Berry	1,312	0	0
Hockley & Co., Grantham	1,275	0	0
Maxey & Son	1,242	0	0
A. J. Elmes, Gainsborough	1,140	0	0
H. Pattinson, Ruskington, Sleaford	1,122	10	3
J. Banks & Son*	1,087	1	6

* Accepted. [Rest of Sleaford.]

Smethwick.—Accepted for the erection of a steel skew bridge over the canal, for the Town Council :—

E. C. & J. Keay	£2,189

Stamford.—For the erection of a free library, for the Library Committee of the Council. Messrs. Hall & Phillips, architects, 6, Great James Street, Bedford Row, W.C. Quantities by Messrs. Andrews & Read :—

J. Cracknell	£2,686	0	0
J. Gutteridge	2,397	0	0
Kettering Co-operative Builders, Ltd.	2,340	0	0
Brown & Son	2,300	0	0
J. Peasgood	2,177	0	0
J. Woolston	2,166	0	0
Hinson & Co.	2,163	15	0

Stow-on-the-Wold (Glos).—For the erection and completion of a new rectory, for the Rev. J. T. Evans, M.A. Messrs. Healing & Overbury, architects, Cheltenham and Gloucester :—

T. Burden, Chipping Norton	£2,709	2	0
G. Howman & Co., Stow-on-the-Wold	2,311	13	10
A. Groves & Sons, Milton-under-Wychwood	2,301	11	0
Byard & Son, Gloucester	2,227	0	0
Collins & Godfrey, Tewkesbury	2,130	0	0
Estcourt & Sons,* Gloucester	2,120	0	0

* Accepted subject to modifications.

(Continued on p. xx.)

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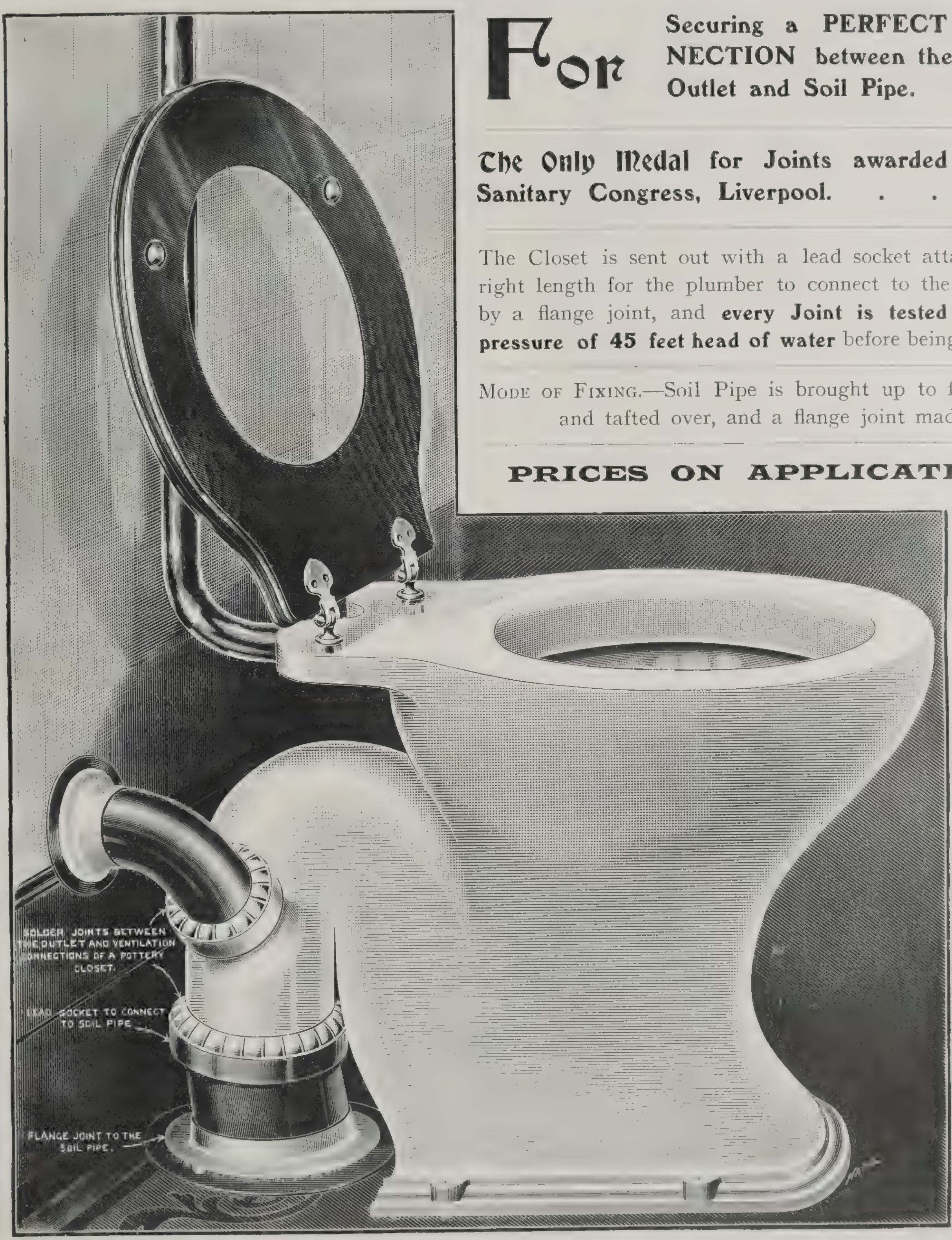
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TENDERS – *cont. from p.* xviii.

Glemsford.—For water-works, for the Urban District Council. Mr. John T. Eayrs, M.I.C.E., engineer, Birmingham :—

Contract 2.—Cast-iron pipe and specials.

Watson, Gow & Co., Glasgow	£806	17	3
Cochrane & Co., Dudley	769	9	6
Edward Tabor, Cambridge	768	9	1
Biggs, Wall & Co., Finsbury Pavement	751	15	5
F. C. Thurman, Walton Works, Suffolk	744	3	3
A. G. Cloake, 54, Holborn Viaduct	738	16	9
Alfred H. Ball & Co., Maidstone	736	8	9
The Staveley Coal and Iron Co., Chesterfield	734	17	5
W. B. M. Jackson, Chesterfield	734	11	1
The Claycross Co., Chesterfield	730	19	6
The Stanton Ironworks Co., Nottingham	723	2	6
Oakes & Co., Alfreton	710	0	0
The Howell Iron Co.,* Melton Mowbray	702	15	1

* Accepted.

Contract 3.—Laying and jointing water mains.

W. Hodge & Sons, Birmingham	£619	12	1
Langley & Westmoreland, Kirton, Lincolnshire	564	18	5
Alfred H. Ball & Co., Maidstone	530	18	7
F. C. Thurman, Walton Works, Suffolk	519	4	3
Arthur Jarvis, Newmarket	494	12	3
Edward Tabor, Cambridge	482	19	0
Rogers & Wood, Lewisham	459	16	6
A. E. Appleby,* Leyton, Essex	399	1	4

* Accepted.

Contract 4.—Water tower and pumping station.

Harry Frown, Cavendish, Suffolk	£881	2	0
G. Grimwood & Sons, Sudbury, Suffolk	789	10	0
McKay, Clacton-on-Sea	693	10	0
F. C. Thurman, Walton Works, Suffolk	663	7	0
Spencer, Santo & Co., Felixstowe	650	14	1
Rogers & Wood, Lewisham	617	7	0
Edward Tabor, Cambridge	613	10	0
Langley & Westmoreland,* Kirton, Lincolnshire	563	0	1

* Accepted.

Contract 5.—Oil-engine and pump.

The National Gas Engine Co., Ltd., Ashton-under-Lyne	£669	17	6
Ruston, Proctor & Co., Lincoln	581	6	6
Gimson & Co., Leicester	565	16	0
Glenfield & Kennedy, Kilmarnock	565	1	6
Hornsby & Sons, Grantham	548	3	6
Hayward, Tyler & Co., London	546	10	3
Edward Tabor, Cambridge	529	7	6
Timmins & Sons, Runcorn	492	13	6
Crossley Brothers, Openshaw, Manchester	487	2	6
George Waller & Son, Stroud	458	9	6
Tangyes, Ltd., Birmingham	457	17	6
Pollok, Whyte & Waddel, Glasgow	442	12	6
Alfred Dougal & Co., Leeds	439	13	6
W. H. Bailey & Co., Salford, Manchester	437	7	6
Frank Pearn & Co., Manchester	429	19	6
The Britannia Engineering Co., Colchester	417	1	2
The Campbell Gas Engine Co.,* Halifax	400	0	0
G. R. Mather & Son, Wellingborough	391	11	6
Blackstone & Co., Stamford (engine only)	159	7	6

* Accepted.

Contract 6.—Circular steel tank 20ft. 3ins. diameter by 15ft. 6ins. deep, for water tower.

Lancaster & Co., Bow Tank Works, London	£877	17	6
Dodman & Co., King's Lynn	568	16	6
Edwin Danks & Co., Oldbury	559	9	0
Edward Tabor, Cambridge	498	0	4
Mechan & Sons, Glasgow	435	0	0
Hanna, Donald & Wilson, Paisley	430	10	0
Francis Morton & Co., Liverpool	427	16	9
Samuel Wheeler, Smethwick	365	7	6
The Barrowfield Ironworks, Glasgow	352	17	10
R. & J. Dempster, Ltd., Manchester	338	10	0
Heenan & Froude, Worcester	335	11	6
Thomas Piggott & Co., Birmingham	334	0	0
Gimson & Co., Leicester	332	19	6
Newton Chambers & Co., Sheffield	270	8	6
Westwood & Wrights,* Brierley Hill	266	6	0

* Accepted.

An Opera House at Ostend is to be built directly behind the King's Castle, with which it will be connected by an underground passage. It is planned on the model of the Festival House at Bayreuth, but it will have greater seating accommodation.

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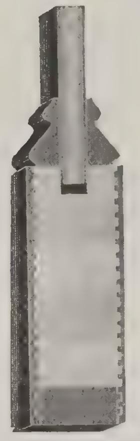

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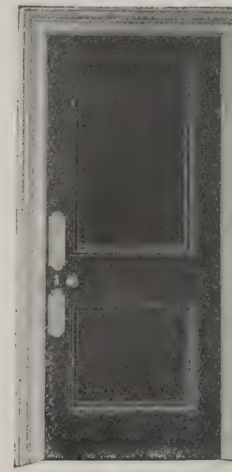

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THE
BUILDERS' JOURNAL
AND ARCHITECTURAL RECORD.

April 12, 1905. Vol. 21, No. 531. 6, Great New Street, Fetter Lane, E.C.

Summary.

Severe tests at a Newcastle warehouse built of Hennebique reinforced concrete were conducted last week. Two beams, respectively of 28ft. and 35ft. span, were loaded with 205 and 257 tons of steel bars and rails. Under this load the deflection in the middle of the beams did not exceed ⅜in., and as soon as the process of unloading was started the beams gradually recovered their original level. (Page 186.)

A discussion on architects' registration took place before the Edinburgh Architectural Association last week. The general opinion of the meeting was favourable to the proposal. (Page 196.)

The Tibetans have not realized the principle of the wheel or the arch, but, curiously enough, thoroughly understand the cantilever principle in bridges. (Page 192.)

The lady architect will put in plenty of cupboards in her home, because without cupboards life is not worth living (to a woman)! Her kitchen will be in just proportion to the size of the house, and not a kind of baronial hall in which even the beetles look lonely. (Page 193.)

The new Workmen's Compensation Bill, amending and extending the old Acts, was read a second time in the House of Lords last week. It is intended to abolish the restriction as to heights of buildings and the use of scaffolding. (Page 186.)

The carpenters have selected three candidates to be run for Parliament in their interests. (Page 186.)

Scarborough's new sea-wall has been so badly damaged by the gale of January 7th that Mr. Walker, the engineer, recommends that buttresses be erected in concrete at a cost of £8,000. (Page 192.)

The "Times" gives its support to the R.I.B.A. memorial against important architectural work for municipalities being put in the hands of surveyors and engineers. This system does not produce economical work, it cannot produce artistic work, and it is subversive of the interests of the individual. (Page 185.)

The Victoria and Albert Museum will be finished by February, 1907, and the new College of Science building ready for occupation next spring. An important reply as to the rebuilding of Regent Street Quadrant was given in the House of Lords last week. (Page 194.)

The St. Louis Exhibition buildings were of timber throughout, covered with "staff" on the exterior. They afforded the greatest example of carpentry ever executed. (Page 190.)

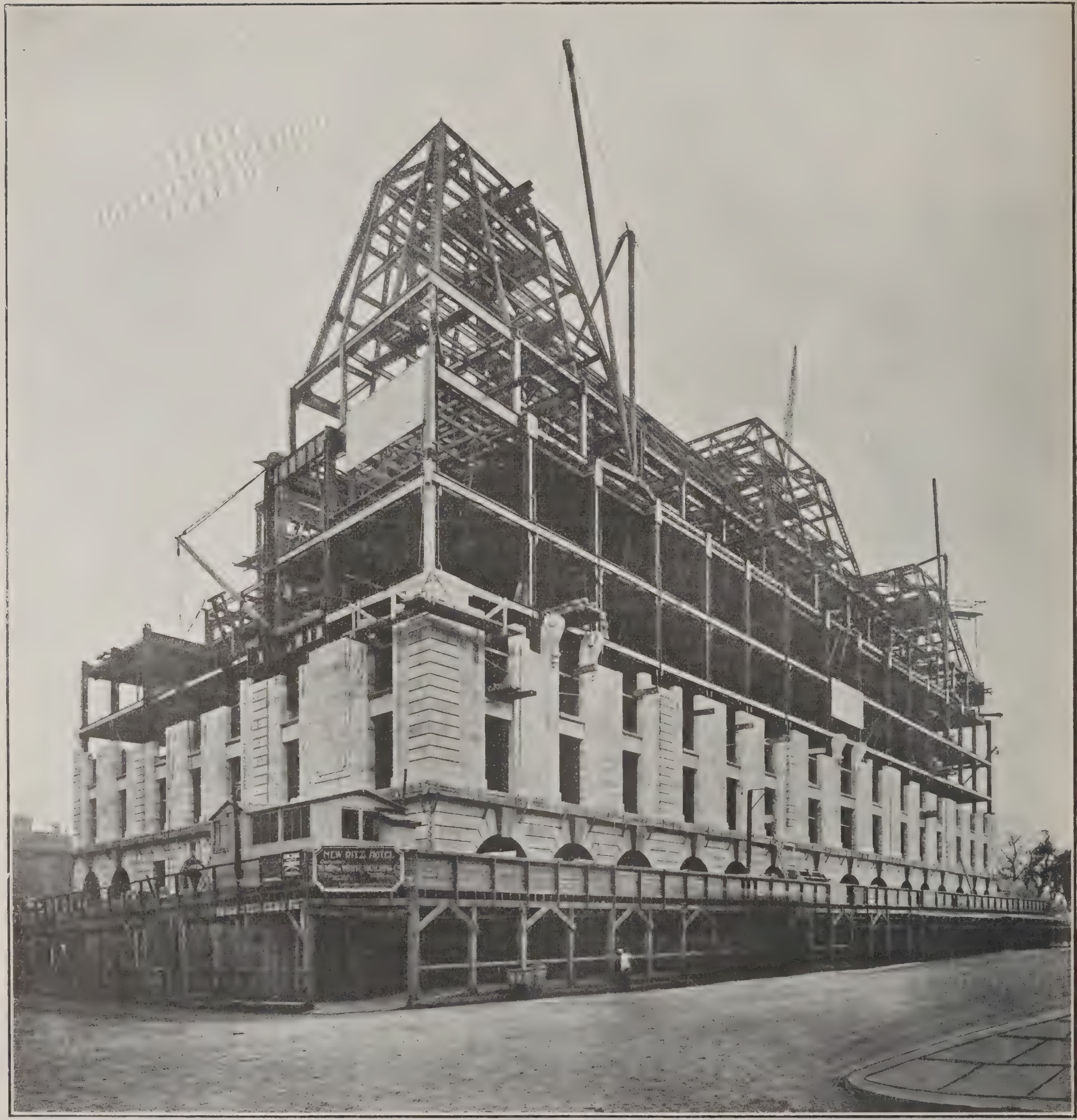
The London timber trade showed little change during March. (Page 188.)

Contractors' Deposits and Bribery. THE trial and conviction of the ex-town clerk of Holborn has drawn attention to the bribery and corruption that exists among public officials of municipal bodies, and the daily press is railing against details of the system of dealing with contractors which have been abused—such as deposits from firms tendering for contracts. Every system is open to abuse, and the only way to prevent this is to have adequate supervision. We cannot expect to have a system that will automatically safeguard against fraud. It is right, however, to insist that a system shall afford as few openings for fraud as possible, and criticism may be usefully directed to this end. Now the object of asking firms to deposit a sum which will be returned on receipt of a bona-fide tender before supplying them with bills of quantities and drawings is to save the expense of having to send copies to a large number of firms who do not tender. This precaution is a wise one, but it is only necessary where the expense of printing quantities, &c., is considerable. With most municipal contracts it is unnecessary because the contracts are only suitable for local competition, and the quantities, specifications, &c., are short and arranged in a regular form, and being printed it costs very little for a large number of copies. The modern appliances for cheaply taking copies of drawings, &c., such as the Mimeograph, Neostyle, photo-prints, &c., make the old precautions for limiting the number of copies supplied to contractors unnecessary except in a few cases. Thus the chances of contractors purposely never asking for the return of their deposits in order to get consideration from the all-powerful officials would decrease, while if the officials were made to account without delay for all deposits received it should effectually prevent any fraud. There are many malpractices in tendering familiar to contractors, and the employers' federations throughout the country ought to take steps to stop these by protesting against ill-advised clauses in conditions, &c. A corporate body can do so where a private contractor cannot without harming himself. Corruption should also be looked for among smaller officials. Where no cases of downright fraud exist many questionable transactions are carried on. It is easy to talk about the "callousness" with which many persons regard such transactions, as the judge said in this case of the ex-town clerk of Holborn, but we must make excuse for human nature, and the criminal fault lies with our municipal councils, who give a more or less educated man in a position of trust a wage no larger than a good craftsman earns—£2 10s. or £3 per week, without ever any appreciation of his honest efforts. Can it be wondered that surveyors, clerks, foremen, time-keepers and others sometimes fall under temptation? The remedy is to give them an adequate salary, with increases for good service and the study of economy, as a private firm would do. After all, there is far less corruption among the municipal officials of this country than in other countries abroad.

At Last a Site. AFTER so many years, the search for a site for London's county hall had almost become ludicrous, but last December the Council braced itself up for something decisive, and as the result of its instruction to the Establishment Committee there is now before it a definite proposal for the acquisition of a site beside Westminster Bridge, on the southern bank of the Thames. This site seems to be an excellent one, with many possibilities of fine architectural treatment, and we think the Council would do well to acquire it. The site itself is estimated to cost £600,000; the buildings, &c., £1,056,000; and the formation of an embankment (as in front of St. Thomas's Hospital), £44,000—a total of £1,700,000. The river-frontage is approximately 800ft. For the purpose of comparison we may mention that the frontage of Somerset House is about 550ft. The Committee remark that the river at this point runs nearly due north, and that the site being approximately parallel with the river, three façades would be respectively on the south, east and west aspects, thus obtaining the maximum of sunlight throughout. They suggest that the council-chamber and committee-rooms might be placed in the centre and grouped as a central feature, and in this position would be subject to a minimum of the external disturbing influences of traffic and noise. The advantage of the present scheme, compared with those previously submitted to the Council, is shown by the following table:—

Site.	Cost.	Area.
Parliament Street (1893)	£750,000 ...	About 2¼ acres.
Spring Gardens (1896) -	813,000 ...	,, 2 ,,
Adelphi (1902) - -	900,000 ...	,, 3½ ,,
Westminster Bridge (1905) - - - -	600,000 ...	,, 5½ ,,

The estimated expenditure on this suggested scheme is large; and in view of the huge undertakings the London County Council has at present on hand, it may meet with much opposition, but for our part we hope this great architectural opportunity will not be lost. Our civic spirit should surely be sufficiently stirred by such a prospect as to be willing to pay the piper. We should be able to carry out such a scheme as this; indeed there would be no doubt about doing so if the borough councils were less wasteful.



RITZ HOTEL, PICCADILLY, LONDON: GENERAL VIEW ON APRIL 1ST, 1905. MEWES AND DAVIS AND JOHN B. BISHOP, ARCHITECTS.

THE RITZ HOTEL.

WE give on this page a photograph of the Ritz Hotel taken on April 1st from the corner to Piccadilly and Arlington Street. The Arlington Street front of the building is much lower than the other, and the exterior wall is set back at third and fourth floors, rendering a relatively complicated framing necessary in order to properly support the pavilions, which are the highest parts of the building.

The method of supporting the set-back corner columns is illustrated by the photograph on the page opposite, which shows the support for the Arlington Street pavilion. On top of the column shown to the right rests a single-web plate-girder, the web being reinforced by two plates ⅜in. thick—one riveted on each side and extending part of the length of the plate-girder in order to take the shear caused by the load from strut or set-back column resting on another girder running at right angles to the Arlington Street building line, which girder is web-connected to the plate-girder.

The web reinforcing plates have milled edges to butt against girder-flange angles. The single-web plate-girder parallel to the Arlington Street building line, in addition to the vertical reinforcing plates, is strengthened by stiffener-angles 3½ins. by 3½ins. by ⅜in., riveted on each side of the web plate. These are milled at the ends so as to fit the flange of the girder. The distance between them is about 3ft., which is the depth of the girder.

The load is transferred from the web of the girder to the column (shown to the right in the photograph) upon which the greatest load is supported by means of vertical stiffener angles, riveted to the girder directly over the column, and a plate shop-riveted to the flange-side of the column in a similar way to a splice-plate, the upper end of this plate being field-riveted to side-connection angles shop-riveted to the girder. The vertical angle-iron on this same plate was riveted on in the shop so as to avoid the plate being bent during transportation. The plate-girder was made with single web in order to ensure good connections and concentric loading. The method for calculating similar girders will be dealt with in our columns later.

The compound-girder at right angles to Arlington Street, previously referred to, is composed of two 22ins. I-beams (German section: N.P. 55 cm.) and two plates ½in. thick, riveted on top and bottom flanges. This compound-girder carries the set-back walls from fifth to sixth floor, and also two set-back columns (one of which is shown to the right in the view). These set-back columns are not seated centrally on the compound-girder, and therefore have two vertical base stiffening-plates riveted on the flange side of the column in order to transfer the load equally to both beams and their webs, and also to stiffen the base-plates, which have holes for field rivets. Similar construction with girders to carry set-back walls and columns at the fifth-floor level is adopted all round the building. It is clear that the weight of steel required for the building is noticeably increased by the exterior walls being set back and so causing great concentrated loads on the cross-girders.

The sloping roof is carried on **I**-beams at the sixth-floor level. These **I**-beams also carry hip-rafters and rafters. The hip-rafters are made of two channels latticed, as may be seen from the two photographs reproduced in this issue. The beams are connected by means of top and bottom angle-iron brackets similarly to the columns.

The rafters are generally composed of two channels riveted back to back, with ⅜in. thick filler-plates between, placed some distance apart. At each floor level these filler-plates are made larger and form gussets on to which the floor beams are web-connected. This kind of connection also gives rapidity to the roof construction.

In each of the corner pavilions are placed water tanks, and the construction supporting them is, where necessary, braced by diagonal rods with turn buckles.

It may be added that all columns which carry light loads, as in the upper storeys, are made latticed similarly to the hip-rafters, the idea being to use a laterally strong section and at the same time a light section.

ARCHITECTS AND PUBLIC WORKS.

The "Times" supports the R.I.B.A. Memorial.

IN the "Times" of Thursday last a long article appeared on "Architects and Public Works," having for its subject the memorial addressed by the R.I.B.A. and its allied societies to about 1,500 county, borough and urban district councils throughout the Kingdom. The opinions set forth in this memorial are already known to our readers, having been fully dealt with in our columns, but the following remarks may be quoted from the "Times" as of interest and likely to have a good effect:—

It is a grievance that only in Bradford, Hull, Nottingham, Dublin, Aberdeen, Leith and Dundee is there a "city architect"; in many other towns duly qualified architects are not employed, the buildings being designed in the office of the surveyor or engineer. Now the surveyor and engineer, although highly-trained men in their own professions, are not trained in the knowledge of architecture. Many surveyors, no doubt, profess to combine with their legitimate business the practice of architecture, and are prepared at the same time, as has been said by Mr. Newton, to advise on light and air cases, easements, party-walls, perpetual and interim injunctions; will take out quantities, measure extras and omissions; in fact, do almost anything except architecture. For legal purposes an "architect" is a "surveyor," and he is dragged into cases to give evidence on points having no connection whatever with architecture; he may be a land surveyor, a developer of building estates, an arbitrator or expert on matters of building law, or a quantity surveyor. Such a combination is necessarily unfortunate, for the architect and the surveyor require each a different order of mind . . . .

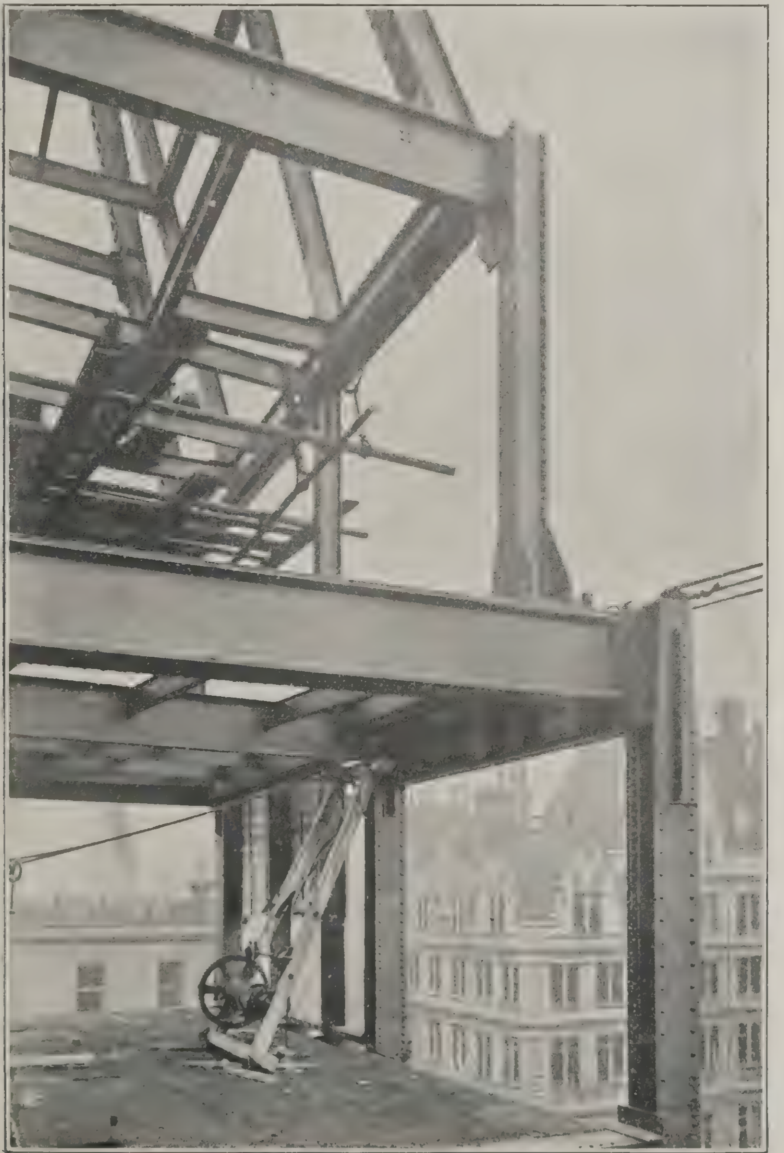
When an official architect's department is established the results are naturally better, but are by no means satisfactory, for the system encourages "stencil-plate architecture"; and there is none of that inducement to effort and originality which the spur of emulation inevitably brings forth.

What the Departmental Office should do.

There is a consensus of opinion that only unimportant utilitarian works, repairs and so forth should be carried out by the departmental office, and that all such buildings as technical schools, art galleries, public baths, municipal libraries and so forth, and certainly all buildings of a monumental character, should be placed in the hands of independent architects as the only means of obtaining variety and consistent effort; and, further, that there should be set a limit of cost beyond which work should not be carried out by an official. Some would place it as low as £500. The Birmingham City Council resolved some time ago that all work above £10,000 should be competed for—a rule which has not always been respected. In Sheffield, on the other hand, municipal architectural work is to a great extent being given to local private practising architects, with encouraging results. It should, however, be recognized as a general principle that no building is "unimportant," however small and inexpensive; and that it is desirable that even tramway buildings and gasworks offices should be in as good taste and as skilfully planned, to secure economy, as the most splendid pile in the centre of the city. In Leicester, broadly speaking, things are for the most part as they should be; the engineer builds the destructors and kindred works, and public buildings are given to independent architects; but Birmingham depends on its surveyor's department. In such towns as Wolverhampton and Brighton the evil system prevails, and it has produced lamentable results; and in Burnley within the past few months the large technical schools, involving very considerable outlay, have been handed over without hesitation to the borough surveyor . . . .

The Example of Bradford.

There is a good deal in the contention that under our system the creation of an architectural department involves, sooner or later, the creation of work for that department to do in order to keep its considerable staff working economically—that is to say, at high-pressure. Of the unpremeditated growth and encroachment of the "surveyor's department" we have a typical example at Bradford, where, before the setting up of the department, ordinary work was carried out by the city surveyor and important buildings generally by direct commission or by competition. When the department was established it was intended that it should deal with minor works only; at the present time an important extension work, involving £100,000, is being done by the city architect with the assistance of a London consulting architect. Furthermore, the School Board has its official architect, the board of guardians has its official architect, the largest industrial combination in the district has its official architect, so that there is little or



RITZ HOTEL: STEELWORK TO BASE OF PAVILION AT PICCADILLY AND ARLINGTON STREET CORNER.

nothing left to local architects to do except small and uninspiring work.

It is held, therefore, that the business of a department should be restricted to its proper functions—that is to say, to the management of Corporation property and examination of and report on building plans—so as to ensure due observance of the by-laws. It may be accepted that the prevailing system and lack of system is injuring, and will continue to injure, the architectural profession, and it will exclude the class of men most required to maintain and raise the standard of architectural achievement. It does not produce economical work, it cannot produce artistic work, and it is subversive of the interests of the individual, from whom the new thing and the original thing is invariably derived.

Builders' Notes.

Builders' Clerks' Benevolent Institution.—At the twenty-seventh annual dinner held last week at the Holborn Restaurant the secretary announced subscriptions amounting to £750, including 100 guineas from the president, Mr. James Carmichael.

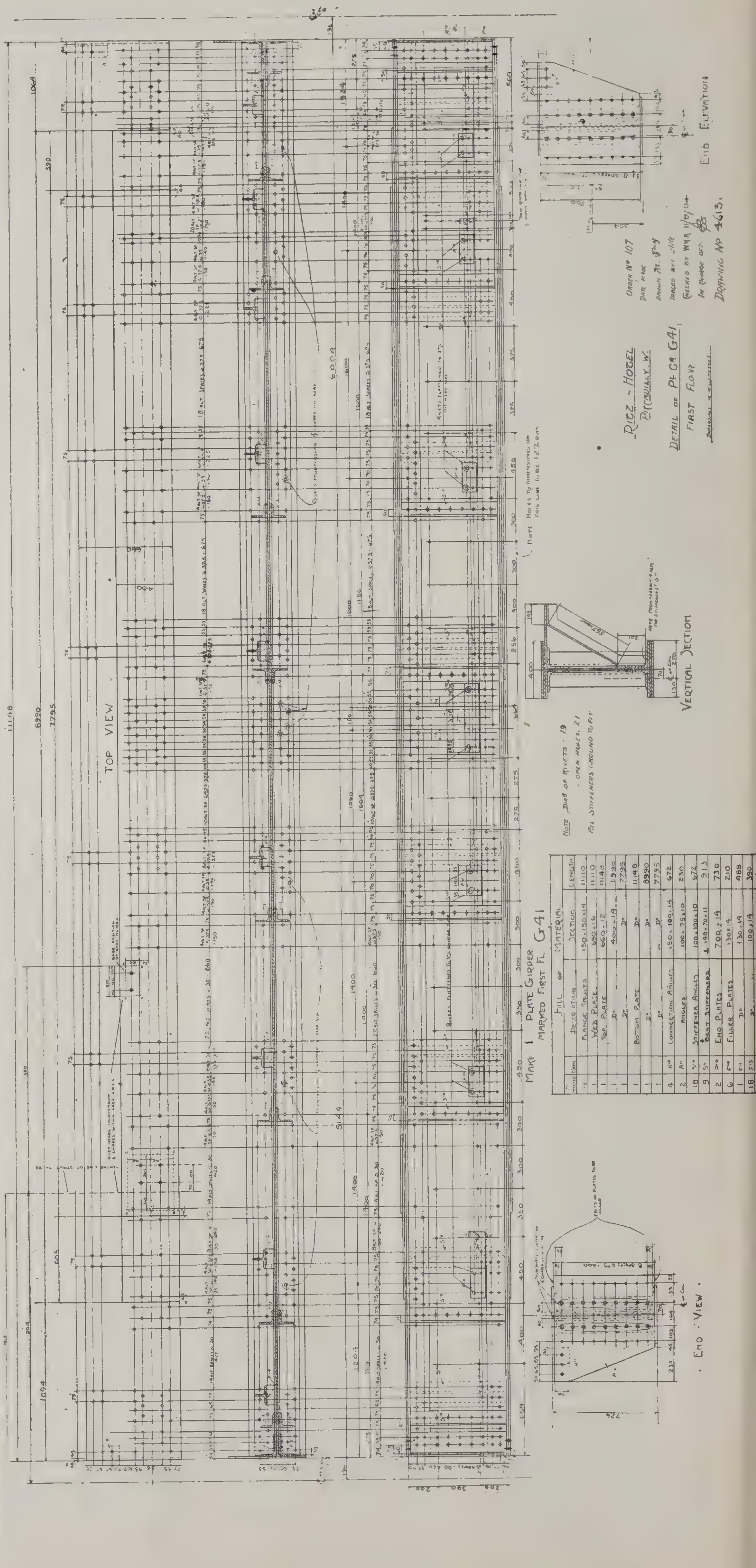
Leicester Building Trade Dispute Settled.—The difficulty with respect to walking boundaries and leaving-off time for the painters, joiners, bricklayers and builders' labourers at Leicester has been amicably settled, thanks to the conciliatory spirit of masters and men and the tactful mediation of Mr. Alderman Smith.

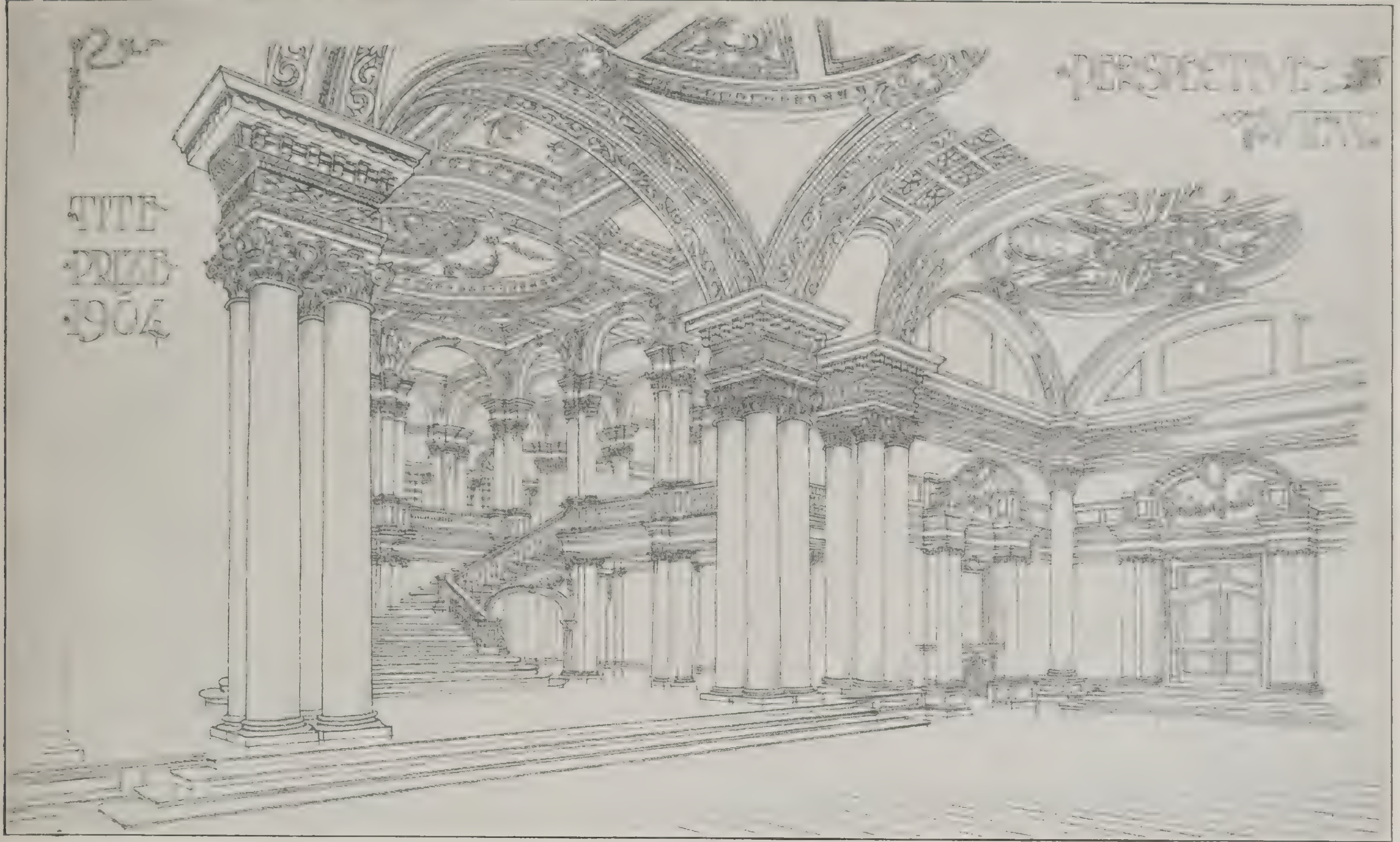
Carpenters' M.P.'s.—The final ballot of the members of the Amalgamated Carpenters and Joiners for the selection of three candidates to be run for Parliament at the general election has resulted as follows:—Councillor George Dew, L.C.C.; Mr. W. T. Wilson, Bolton; Mr. W. Walker, Belfast. Election expenses will be paid by the society, also a salary if returned to Parliament.

Notices of Reduction in Wages in the North.—The bricklayers, masons and plasterers of Sunderland have received from the masters notices of a reduction of 1d. per hour in their wages and of certain alterations in the working hours and conditions. At present the hours vary from 50 per week in summer to 41½ in winter. Similar notices have been given in the building trade on the Tyne and other districts. It is hoped, however, that the matter will be settled amicably.

The Workmen's Compensation Bill, amending and extending the Workmen's Compensation Acts of 1897 and 1900, was read a second time in the House of Lords last week. The Bill extends the Compensation Acts to all buildings irrespective of height or the use of scaffolding and machinery, laundries where steam power is used, workshops where more than five persons are employed, and to all persons employed in the care and management of horses and locomotives.

Severe Tests of a Warehouse.—Tests of abnormal severity were carried out last week at the warehouse in course of erection at New Bridge Street Station, Newcastle, for the North-Eastern Railway Co., inasmuch as no fewer than six goods trains may be at a time standing or running on the floors of this warehouse. The building is built entirely of reinforced concrete on the Hennebique system. The tests, carried out under the supervision of Mr. William Bell, F.R.I.B.A., architect to the North-Eastern Railway Co., assisted by Mr. A. Pollard, were conducted by Mr. T. J. Gueritte, C.E., who represents the patentee in the Newcastle district. Two beams, respectively of 28ft. and 35ft. span, were loaded with 205 and 257 tons of steel bars and rails. Under this load the deflection in the middle of the beams did not exceed ⅜in., and as soon as the process of





DESIGN FOR A LOUNGE TO A LARGE HOTEL, BY F. E. OSBORNE.

unloading was started the beams gradually recovered their original level. The tests were considered highly satisfactory.

Mr. James Barnes, one of the oldest and best known members of the Brighton building trade, died last Friday, aged 72. One of his chief works was the rebuilding of Aldrington Parish Church thirty years ago.

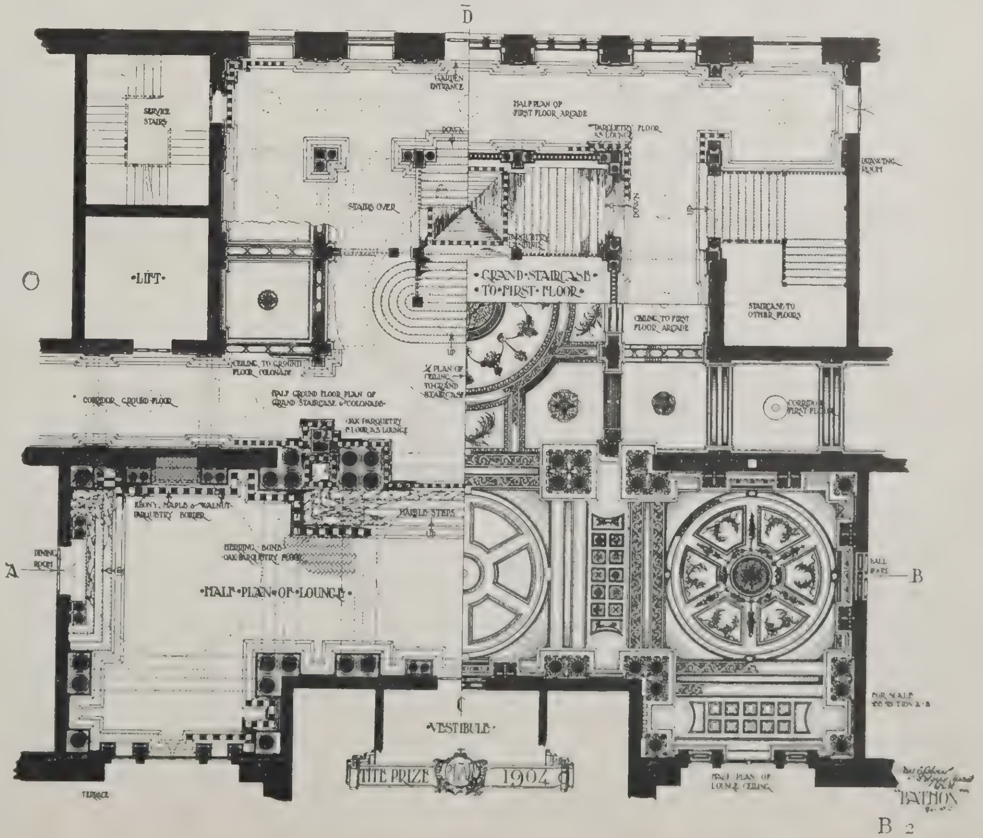
American Industry. — Speaking on this subject at the Royal Institution on Friday, Mr. Alfred Mosely, C.M.G., pointed out how close together the masters and the men were in America; the willingness of employers to listen to and pay for ideas originated by their men provided a brain-force that was ever working to improve the methods of manufacture. Moreover, piecework was the order of the day, and the men could rely on the prices not being "cut," the employer seeing that the more his men could turn out the better it was for himself.

Slag Cement.—The Dominion Iron and Steel Co., an important manufacturing corporation of Sydney, Nova Scotia, has formed a subsidiary organization under the name of the Sydney Cement Co. to manufacture cement from the slag resulting from their ordinary product. A capital of £100,000 has been subscribed, half of which is being spent on plant with a capacity of 500 barrels a day, and a coopering establishment is being added which will be capable of producing 50,000 barrels per annum. The quality of the manufactured material is said to be excellent, and the example of the Nova Scotia firm is to be followed by one of the chief Belgian companies.

Building Accidents in Glasgow. – Accidents to workmen employed in the erection of buildings in Glasgow have been so numerous that the attention of the Scottish Office has been called to the matter. Communications have been passing between the Secretary for Scotland and the Committee on the Building Regulations Act, 1900. At present the supervision and inspection of buildings in course of erection is carried out by inspectors in the Master of Works Department as part of their regular duties. For this purpose the city is divided into eight districts, and in each of these districts there is an inspector, and in some districts an assistant also. These inspectors, however, have many other duties, and it may be taken as a fair average to assume that they go into each building in course of erection in their respective districts about once per week. With this system of supervision the Master of Works considers that it would be impossible for the inspectors to deal with many of the matters submitted to them, especially where the scaffolding and gangways might possibly be shifted several times per day. A special sub-committee is enquiring into the whole matter.

DESIGN FOR AN HOTEL LOUNGE.

THE above design, submitted by Mr. F. E. Osborne for the Tite Prize this year, was planned with the idea of providing a lounge the whole length of which would not have to be crossed by guests entering the hotel and passing to the suites of rooms on the upper floors, thus destroying the seclusion of the greater part. The floor of the lounge being lower than the level of the ground floor, tends to make the grand staircase and entrances to the ball- and dining-rooms more imposing in elevation. The area of the lounge is 2,947 sq. ft.


D
GARDEN ENTRANCE
HALF PLAN OF FIRST FLOOR ARCADE
PARQUETRY FLOOR AS LOUNGE
SERVICE STAIRS
DOWN
DRAWING ROOM
STAIRS OVER
PARQUETRY LANDING
DOWN
UP
•LIFT•
•GRAND•STAIRCASE•
•TO•FIRST•FLOOR•
O
CEILING TO FIRST FLOOR ARCADE
STAIRCASE TO OTHER FLOORS
UP
CEILING TO GROUND FLOOR COLONADE
¼ PLAN OF CEILING TO GRAND STAIRCASE
CORRIDOR GROUND FLOOR
HALF GROUND FLOOR PLAN OF GRAND STAIRCASE & COLONADE
CORRIDOR FIRST FLOOR
OAK PARQUETRY FLOOR AS LOUNGE
EBONY, MAPLE & WALNUT PARQUETRY BORDER
MARBLE STEPS
HERRING BONE OAK PARQUETRY FLOOR
DINING ROOM
A
•HALF•PLAN•OF•LOUNGE•
BALL ROOM
B
FOR SCALE SEE SECTION A-B
C
•VESTIBULE•
TITE PRIZE PLAN 1904
HALF PLAN OF LOUNGE CEILING
TERRACE
"BATHOS"

THE TIMBER TRADE.

London Market in March.

THERE is little change to report in the London market for wood during March. The trade has been dominated by lack of demand, and this has prevented any improvement, in spite of a dock stock, which may be calculated at about 15,000 standards less than at this time last year; a low level of price which puts no obstacle in the way of consumption; an improving general trade and an obvious scarcity in many classes of supply.

Messrs. Churchill & Sim state that the reduction on the very moderate dock deliveries of last year amounts to no less than a further 3,000 standards for the month, and raises the total deficiency for the quarter to over 6,000 standards. The small additions to the overside deliveries tell us very little one way or the other. Prices for deal sizes have improved a little in the month, the stock of them in London being so small that sellers have been able to hold their own in a retail fashion. For nothing else is there much change except for prepared boards, which have fallen again sharply under pressure of a more than ample supply for a feeble demand. For wholesale business for further supplies from abroad, on the clearing of the ice, quotations are again depressed, Swedish shippers especially having eased prices whenever large business was possible, and it is long since buyers could fill any requirements on such favourable terms. Russian shippers have held steadily to previous quotations during March, and have effected a little business thereat, but have been hampered by cheap offers for resale by nervous buyers. Freights continue plentiful at a steady low level.

Messrs. Denny, Mott & Dickson, Ltd., state that there has been a slight all-round improvement in selling prices, and the attitude remains one of expectancy for broader and better business generally. Small traders have required a good deal of consideration to keep them going until the better times come; but last year's losses have been as a whole soundly regulated, and the timber trade is able and expectantly ready to take its share in the improvement in trade generally which is thought by many careful observers to have already begun.

The abstract of stock, consumption, &c., for March, published by Messrs. Foy, Morgan & Co., is given in the table at the foot of this page.

Dock Stocks.

The stock of wood in the public docks on March 31st was:—

	Pieces.
Foreign deals and ends - - -	1,167,000
Do. battens - - - -	2,024,000
Pine deals and battens - - -	1,113,000
Spruce do. do. - - -	879,000
Boards, rough - - - -	3,081,000
Do. prepared - - -	7,097,000

Totalling 15,361,000 pieces, as compared with 17,706,000 in 1904, 14,636,000 in 1903 and 16,878,000 in 1902.

In other kinds the stock was as follows:—

Foreign wainscot logs - -	195 pieces.
Do oak timber - - -	804 loads.
Do. fir timber - - -	692 do.
Do. Oregon pine, &c., spars and masts - -	4,596 do.
Colonial oak timber - - -	1,425 loads.
Do. birch timber and planks -	1,985 do.
Do. elm and ash timber -	735 do.
Do. yellow pine - - -	418 do.
Do. red pine - - -	243 do.
United States pitch-pine timber -	16,513 do.
Do. do. deals -	39,000 pieces.
East India teak - - -	7,621 loads.

The deliveries for the first quarter of the year have been—

	Pieces.
Foreign deals and ends - - -	860,000
Do battens - - - -	1,563,000
Pine deals and battens - - -	255,000
Spruce do. do. - - -	412,000
Boards, rough - - - -	1,759,000
Do. prepared - - -	3,693,000

Totalling 8,542,000 pieces, as compared with 9,434,000 in 1904, 10,552,000 in 1903 and 10,267,000 in 1902.

The deliveries for March were as follows:—

	Pieces.
Foreign deals and ends - - -	296,000
Do. battens - - - -	576,000
Pine deals and battens - - -	91,000
Spruce do do - - -	171,000
Boards, rough - - - -	659,000
Do. prepared - - -	1,327,000

Totalling 3,120,000 pieces, as compared with 3,599,000 in 1904, 3,630,000 in 1903 and 3,211,000 in 1902.

Deliveries from Ship to Craft for the first quarter of the year were:—

Deals and battens - - -	5,171 P.s.h.
Boards - - - -	2,303 do.

and for March:—

Deals and battens - - -	1,740 P.s.h.
Boards - - - -	1,011 do.

Soft Woods.

Swedish Deals.—Prices for these in London have been quite steady during March, but only piecemeal. They are now being quoted cheaply on cost, freight and insurance terms for prompt arrival, though only in quite moderate quantities. For all classes of battens there is no change to record. Prices for prepared boards shrank all round during March, consequent on a full competing arrival from the Norwegian ports.

Norwegian Boards.—The figures of the arrival of prepared boards during March are about three times those for March last year, and, although moderate enough in themselves, this has been quite enough to upset a nervous market. Prices have fallen freely, and it has been difficult to recoup cost for anything.

Russian Deals, Battens and Boards.—A large proportion of the remaining dock stock of deal sizes has been disposed of during March without much variation on previous quotations, and it has even been possible to mark a point upwards here and there for anything of satisfactory quality. For other sizes there is no change to report since February.

Finnish Battens.—There has been no change to report in the prices of Finnish battens in London during March. There is no pressure to sell them for arrival, and any that can be picked up are at very fully the equivalent cost of present values here.

Prussian Timber.—A small arrival of fir timber during March has been fairly treated, retail prices here showing a shade of improvement in sympathy with the decreasing dock stock of pitch-pine timber. The demand for oak timber was very disappointing during the month, and prices here for the moment look a good deal weaker. The political unrest in Russia, however, is reported to be affecting the usual purchases by the Prussian merchants in the interior of that country, and so far as that proves to be the case, must shut off future supplies to this and other more important markets.

Canadian Deals and Spruce.—Pine deals have been selling rather more freely in London during March, without further reduction of price. For spruce deals there is still no change to record here, though the larger outport markets are said to be responding freely to the enhanced cost quoted for the new season's supplies. For all Canadian hardwoods the London market remains inert; for yellow-pine timber some low prices have been mentioned during the month. The stock of sawn timber in London is reducing quickly, and is already lower than for some time past, while the position at the shipping ports continues to threaten a cessation of further supplies unless at altogether enhanced quotations. The London market, however, moves very slowly, and, in spite of an active demand, cannot be quoted at more than, say, a shilling a load over February rates. The importation of pitch-pine deals is much restricted, and what demand there is has had to be satisfied at a much better rate of price than was the case in February.

American Whitewood.—Logs, if large and prime, realize fair prices, but the demand is soon satisfied; planks and boards—stocks of unplaned wood are sufficient, but for planed boards there is a good demand.

Hardwoods.

Teak.—Messrs. Denny, Mott & Dickson, Ltd., report that the landings in the docks in London during March consisted of 243 loads of logs and 231 loads of planks and scantlings, or a total of 474 loads as against 516 loads for the corresponding month of last year. The deliveries into consumption were 729 loads of logs and 411 loads of planks and scantlings—together 1,140 loads, as against 897 loads for March, 1904.

Figures give ample evidence of the abnormally short supplies of teak at the Indian shipping ports. The unprecedented high prices paid for some months past for fresh imports have failed to result in shipments of any importance; and holders on this side, while obtaining the enhanced prices without much difficulty, see their stocks dwindling—with no sound prospects of adequately replenishing them this year. Business, therefore, continues to contract, and there seems little hope of this market opening out until some estimate can be formed as to whether next autumn's outget from the Indian forests will be sufficient to give promise of a renewal at the commencement of next year of the ordinary supplies to Europe.

Mahogany.—Messrs. Denny, Mott & Dickson state that the demand has been fairly satisfactory, and the market has been generally sound during the first quarter of the year. Prices for good and sizeable logs have on the whole varied but little; but the undue proportion of small and inferior wood has been the weak spot in this market, although the position in this respect has somewhat improved. Messrs. C. Leary & Co. state that the general position of the market shows no change; the improved tone manifested at the beginning of the month has continued and the wood offered at auction met with good competition and well-maintained prices.

ABSTRACT OF STOCK, CONSUMPTION, &C., FOR MARCH.

S.C. Dks. and M. Dks.	Deals (Fir).	Battens (Fir).	Pine.	Spruce.	Pitch-pine Deals.	Deals and Battens in Aggregate.	Rough Boards (All Countries).	Flooring.	Floated Timber.
	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Loads.
Public dock stock - - -	1,008,384	2,143,969	1,112,139	878,441	38,354	5,181,287	3,081,740	7,096,449	22,984
Monthly public dock consumption - - - - -	255,241	643,808	99,449	181,915	16,917	1,197,332	659,594	1,448,487	4,564
Overside stock - - - -	201,640	508,608	78,565	143,714	—	932,527	521,079	159,334	—
Overside consumption (estimated of dock):—									
77 per cent. Sawn 50 ,, Planed	196,536	495,732	76,576	140,076	—	908,920	507,887	724,243	—
Duration of supply at same rate of consumption - - -	2·68 months.	2·33 months.	6·76 months.	3·17 months.	2·27 months.	2·50 months.	3·09 months.	3·34 months.	5·04 months.

STABILITY OF STANCHIONS.

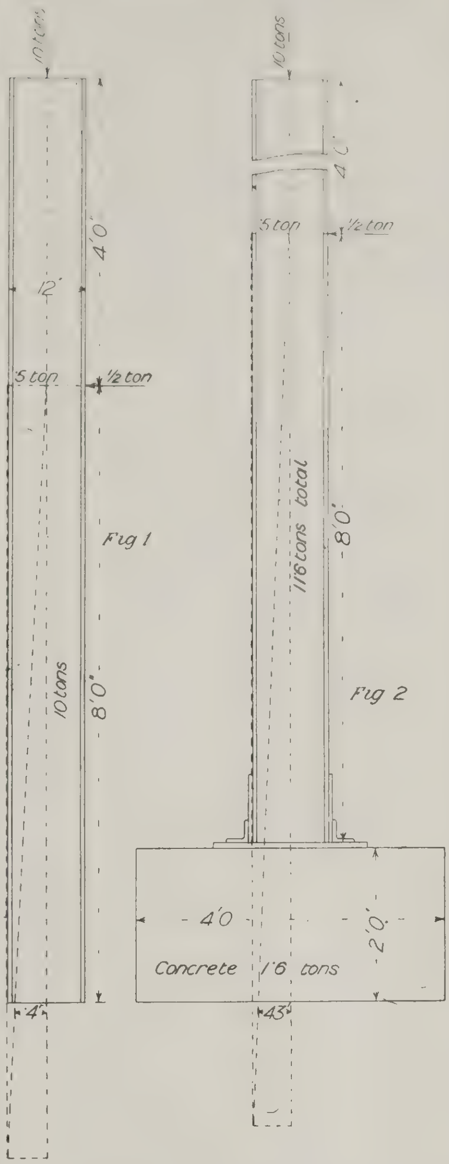
By HENRY ADAMS, M.I.C.E.

A CORRESPONDENT having enquired as to the method of calculating the stability of a stanchion when supporting a roof without being braced to it, and subject at the same time to wind-pressure from the roof and enclosure walls, the matter will be best explained by taking an example. Assume a stanchion 12ft. high, carrying a dead load of 10 tons axially and subject to a mean transverse load of ½ ton acting horizontally at a height of 8ft. This will be a case where a single rolled steel joist will probably be suitable. As there is to be no bracing, the stanchion must be considered as fixed at one end only and free at the other end, so that it will act as a cantilever, but this may be limited to one direction by building in the sides of the stanchion with brickwork. Then by Gordon's formula $p = \frac{f}{1 + \frac{a}{c} \times \frac{l^2}{d^2}}$, where p = safe load in tons per square inch on the given section; f = greatest intensity of stress in tons per square inch under working load (wrought-iron 4, mild steel 6); a = constant depending on condition of ends, both ends fixed = 1, both pivoted = 4, one fixed other pivoted = 2·5, one fixed other free as in this case = 16; c = constant depending upon shape of cross-section and nature of material, for mild steel stanchions, say, = 900; l = length in inches; d = diameter in inches in direction in which it is free to bend. Suppose the section selected for trial be Dorman, Long & Co.'s 8 × 4 × 19 lbs. r.s.j., with a sectional area of 7·3 sq. ins., and a strength-modulus of section of 18·31 sq. ins. in the direction of its depth. Then

$$p = \frac{f}{1 + \frac{a}{c} \times \frac{l^2}{d^2}} = \frac{6}{1 + \frac{16}{900}\left(\frac{120}{8}\right)^2}$$

= 1·2 tons per sq. in. The side thrust from wind will exert a bending moment of ·5 × 8 × 12 = 48 ton-inches, and the maximum stress produced by a bending moment is $p' = \frac{M}{Z}$, where M = bending moment in ton-inches and Z = strength-modulus of section in square inch-units, whence $p' = \frac{M}{Z} = \frac{48}{18{\cdot}31}$ = 2·62 tons per sq. in., which by itself exceeds the maximum stress that may be put upon the section. Try Dorman, Long & Co.'s 12 × 5 × 32 lbs. r.s.j., with a sectional area of 9·41 sq. ins. and a strength-modulus of section of 36·82 in the direction of its depth. Then $p = \frac{6}{1 + \frac{16}{900}\left(\frac{120}{12}\right)^2} = 2{\cdot}16$ tons per sq. in. total, and $p' = \frac{48}{36{\cdot}82} = 1{\cdot}3$ tons per sq. in. But the direct load on the stanchion is only 10 tons, which, with an area of 9·41 sq. ins. $= \frac{10}{9{\cdot}41} = 1{\cdot}06$ tons per sq. in., so that we have 1·3 + 1·06 = 2·36 tons per sq. in. from the combined loads, while the stanchion is capable of receiving 2·16 tons without the maximum stress exceeding 6 tons per sq. in. The difference is so slight that without going through the calculations again we may adopt the 12 × 5 × 39 lbs. section, which is the next available. Suppose, now, that the base plate is to rest upon concrete only, and that there must be a sufficient mass of concrete to resist overturning. The concrete (6 to 1 Portland cement) may be considered capable of bearing a maximum stress of 6 tons per sq. ft., so that a very small area would be necessary to carry the direct load, but the side thrust greatly increases the effect and due allowance must be made for it.

In the accompanying sketch, Fig. 1, it will be seen by the parallelogram of forces that the line of thrust passes 0·4 ft. beyond the axis. Then we have stress on concrete $S = \frac{W}{A} \pm \frac{M}{Z}$, where S = 6 tons, W = load in tons, A = area of base plate in square feet, M = bending moment 0·4 × 10 = 4 ton-feet, and Z = modulus of section = $\frac{1}{6}bd^2$, b and d being breadth and length of base plate. Then $S = \frac{10}{bd} \pm \frac{4}{\frac{1}{6}bd^2}$. Now let b the breadth of base plate = say 2ft., then $S = \frac{10}{2d} \pm \frac{4}{\frac{1}{6}2d^2}$ —or $S = \frac{5}{d} \pm \frac{12}{d^2}$. Assume d also = 2ft., then $\frac{5}{2} \pm \frac{12}{2^2} = 5\frac{1}{2}$ or $-\frac{1}{2}$; but S is fixed at 6 tons, so that 5½ tons per sq. ft. compression on the one edge leaves a slight margin, and ½ ton tension on the other edge is amply provided for by the holding-down bolts through the base plate. This fixes the base plate at 2ft. by 2ft. placed centrally at foot of stanchion, and assumed to be properly connected thereto by angles and gussets. The area of the concrete must be such that there is no tension, or tendency to lift on the inside edge, and the maximum compression at the outer edge must not exceed the supporting power of the earth. Let this be taken at ¾ ton per sq. ft., and try a block of concrete 4ft. × 4ft. × 2ft. weighing 32 cwts. = 1·6 tons. Then the resultant will pass 0·43ft. beyond the axis, and



$$S = \frac{W}{A} \pm \frac{M}{Z} = \frac{11{\cdot}6}{16} \pm \frac{{\cdot}43 \times {\cdot}5}{\frac{1}{6} \times 4 \times 4} = {\cdot}725 \pm {\cdot}002$$

= ·727 tons per sq. ft. compression on outer edge and ·723 tons per sq. ft. compression on inner edge, being just within the agreed limit of pressure. Full details of similar calculations for built-up stanchions are given in "Designing Ironwork," 2nd series, part ii. (Spon, 2s. 6d.), in which other allied cases, such as a stanchion placed at one side or one corner of foundation, are also dealt with.

Law Cases.

A Terra-cotta Contract.—At the recent Birmingham Assizes the case of *The Measham Terra-cotta Co., Ltd.*, v. *John Dallow & Sons* was heard. The plaintiffs are terra-cotta manufacturers of Measham, near Burton-on-Trent, and the defendants are builders, of Blackheath and Birmingham. The claim was for £266, balance of the price of goods supplied and work done. The case for the plaintiffs was that as sub-contractors in the building of a Congregational chapel at Nuneaton they supplied terra-cotta over and above the quantity specified in the contract, and that some of it was more elaborate in design than was indicated in the contract plan. The contract was to supply 1,780 cub. ft. of terra-cotta at 5s. 9d.; and £511 15s., less 2½ per cent. for cash, had been paid for work done under the contract. The dispute arose as to alterations in the detailed plans made by the architects, Messrs. Ingall & Sons, of Birmingham, and the inclusion of two memorial tablets, two corbels and certain figure-work as extras. It was contended by counsel for the plaintiffs that the alterations involved the making of new moulds and that the work was more elaborate than in the original plans.—The defendants denied that they ordered the extra work, and also contended that the alterations made in the plans by the architect made the work easier for the plaintiffs.—The judge decided in favour of the defendants on the ground that there was only one contract, and that was for 5s. 9d. per cubic foot.

The Design of Suburban Houses.—Judgment in the case of *Runtz & Ford* v. *Baker* was delivered by Mr. Justice Wills on March 31st in the King's Bench Division. Mr. Danckwerts, K.C., and Mr. E. M. Pollock (instructed by Messrs. Edwards & Cohen) appeared for the plaintiffs—architects, of Walbrook—and Mr. Dickens, K.C., and Mr. Francis Watt (instructed by Messrs. Webster & Webster) for the defendant, a surveyor, of 62, Coleman Street, E.C. The defendant was desirous of erecting some artistic suburban properties at East Finchley, and certain houses were pointed out to the plaintiffs as possessing internal arrangements which the defendant desired. The defendant did not want to spend more than £1,000 to £1,200 per pair, but Mr. Runtz stated that he pointed out to the defendant that the houses would cost more than this figure. Several sketches and sets of plans and drawings were prepared by the plaintiffs and submitted to the defendant, which he desired modified in certain particulars; then the quantities having been got out, tenders were invited from different builders, the lowest received being for £2,250 per pair. The result of the tenders was made known to the defendant, who objected to the amount required for building the houses, and various conferences took place between the plaintiffs, the defendant, the defendant's builder (Collins) and the quantity surveyors with a view to reducing the cost of the houses, and a list of suggestions prepared by the quantity surveyors and the builder which would reduce the cost to about £1,640 was submitted to the defendant, but apparently no decision was arrived at. The plans and drawings were afterwards returned by the defendant to the plaintiffs with an intimation that he did not require them. Some time afterwards the plaintiffs had their attention called to the fact that five houses had been erected on the land at Finchley, and it was found that the houses as erected were practically identical with those designed by the plaintiffs, and they therefore claimed a proportionate part of the agreed fees, which the defendant declined to pay. Expert evidence was called on both sides. In summing up Mr. Justice Wills said the artistic designs of the plaintiffs had been used in erecting the houses, though the modification that had been executed for the defendant deprived them of much of their beauty. The jury returned a verdict for the plaintiffs for £140, with costs, this sum to include quantity surveyors' fees.

THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Architectural Association was held on Friday evening at 18, Tufton Street, Westminster, the chair being occupied by the president, Mr. E. Guy Dawber, F.R.I.B.A.

Prior to the ordinary meeting, a special general meeting was held for the purpose of adopting the committee's proposal to substitute "council" for "committee" wherever it occurs in the constitution or by-laws of the Association.

Mr. Reginald Blomfield, A.R.A., was elected a member of the Association—a very welcome election, which Mr. Dawber said would be a great aid to their work—and Messrs. C. B. Bone, F. A. Whitwell and P. A. Nash were reinstated.

Further donations to the Building Fund were announced as follows:—

	£	s.	d.
J. H. Squire (further donation) - -	5	5	0
Hugh Stannus do. - -	5	5	0
Stanley Hamp do. - -	3	3	0
C. Rene Harrison - - - -	1	1	0
Leslie T. Moore - - - -	1	1	0
Sundry small donations - - -	1	1	0

The president stated that £3,000 was still required, less £1,000 kindly promised by a generous donor.

It was announced that the annual dinner would be held at the Criterion Restaurant on Thursday, May 18th, at 7.30 p.m. Tickets, price 5s. members, and 7s. 6d. non-members.

The election of officers was announced. The scrutineers stated that they had examined 479 voting papers (twenty-three of which were rejected as invalid), with the following results:—

President.—E. Guy Dawber.

Vice-presidents.—John Murray (317) and Louis Ambler 303).

Committee:

R. S. Balfour (361).
A. Needham Wilson (358).
Henry T. Hare (356).
Arnold Mitchell (311).
J. S. Gibson (296).
W. A. Pite (282).
J. MacLaren Ross (277).
E. A. Rickards (266).
J. B. Fulton (264).
Maurice E. Webb (212).

A paper on "The Buildings of the World's Fair at St. Louis, 1904," was then read by Mr. H. Phillips Fletcher, F.R.I.B.A.

As these buildings have been already described and illustrated in our columns, we only propose to give Mr. Fletcher's general remarks.

After referring to the object of the exhibition—to commemorate the centenary of the purchase (at the price of £3,000,000) of the Louisiana Territory by the United States Government from Napoleon, which greatest deal in real estate more than doubled the area of the original States—Mr. Fletcher described the general plan, which somewhat resembled an open fan and was originated by a committee of some seventeen architects who were partners in nine prominent American firms.

Site Excavation: Track: Roadways.

In preparing the site for the buildings about 2,000,000 cub. yds. of earth were moved, and to facilitate the construction and the housing of the exhibits, fifteen miles of temporary track had to be laid through the grounds.

Burnt ballast, gravel, macadam, asphalt and brick were the materials used in making the fifty-five miles of roads; oak scantlings 10ins. by 3ins. thick being used in the kerbing.

For the main sewerage the exhibition authorities laid down twelve miles of 8in. vitrified pipe sewers and about 1¼ miles of brick sewers.

Wood in lieu of Steel.

In constructing the buildings a new departure was made in constructing them of timber in lieu of steel, by reason of which a great saving in cost was effected. Ample opportunities were thus afforded to the architect of studying this the greatest example of the art of carpentry ever executed, since most of the construction was visible internally, owing to lack of funds to complete the plastering.

Only forty draughtsmen were employed to prepare the drawings for the buildings, the designing and erection of the same occupying two and a half years.

The Timber used and Stresses taken.

Long-leaf yellow pine was used for all posts, roof-trusses and framing. The safe tensile strain was taken at 1,800 lbs. per sq. in., the safe compression perpendicular to the grain 809 lbs. per sq. in., the safe shearing stress parallel to the grain 150 lbs. per sq. in. In the white oak keys the safe stress parallel to the grain was taken at 400 lbs. per sq. in.

Walls.

The walls of the main buildings were 2ft. thick. Steel and wood lathing was used to carry the "staff," which was composed of 2 parts of plaster-of-Paris and 1 of Portland cement, to which Manilla or jute fibre was added, all mixed together with water till in a plastic state.

This composition was either applied direct to the laths or expanded steel sheets, or was cast into moulds, and, when thoroughly dry, nailed to the framed walls. When cast it could be sawn and planed in the same way as wood. It was alleged to withstand the weather if painted, but Mr. Fletcher said it did not.

White Oak Keys

of circular cross-section were used throughout the construction in the following cases:—

(1) To make the shear connections between the individual posts of built-up columns (subject to direct compression and bending strain).

(2) To make all tension splices of jointed timbers break joint wherever they occurred.

(3) To make all attachments to posts and trusses where a force parallel to these members had to be transmitted to them.

These keys, 2ins. in diameter, were driven into holes bored after the individual timbers had been bolted together. When the keys were all in position the bolts were tightened up. The advantage of circular keys was evident from the great saving of expense by their adoption, as but little labour was necessary; they were also speedily fixed in position, and the certainty of uniformity in their fit was certain, since the holes were bored with augers operated by compressed air. The disadvantage in practice was found to be that when the timbers shrunk these timbers could not be tightened up, and in some cases they fell out and did some damage to exhibits beneath. Life and limb being held so cheaply in the States, one must not stop to enumerate the accidents that occurred to the mere public therefrom.

Square keys used as folding wedges were undoubtedly superior, since they could be tightened up; and, moreover, the pressure of the shearing strain did not develop a component laterally, as with the round keys. Doubtless, therefore, these latter would have been adopted if the buildings had been required for any considerable length of time.

The Roof-Trusses employed

were mostly of the familiar Howe type, the span of these varying with the requirements of the different buildings. The main columns measured 14ins. by 3ft. 8ins. on plan, and were composed of two posts 10ins. by 14ins. and one post 8ins. by 14ins., with two sets of packing pieces between 8ins. by 14ins. The columns supporting some of the smaller roof-trusses were composed of two posts, 12ins. by 14ins., with one set of packing pieces of similar scantling between them. Numerous oak keys, as already described, were employed in transmitting from post to post the stresses which these columns were subject to.

The Roofs

were mostly flat, except where architectural effect necessitated them being otherwise, and composition roofing was the chief covering used. The buildings were chiefly lighted by means of skylights, clearstories and lanterns, or "monitors," as the last-named are called in the States.

The Commission of Architects fixed a uniform cornice level of 60ft. above the adopted ground level for the main buildings. This cornice level was, therefore, about equal to the height of the two orders to the banqueting house, Whitehall, and might give some idea of the scale employed.

Discussion.

A discussion followed, in which Colonel Watson (British Commissioner), Mr. Longden, Mr. Collard, Mr. Banister Fletcher and Mr. Dawber took part. Colonel Watson said the buildings were very magnificent outside, but inside the lighting left much to be desired; there was too much light in some places and not enough in others, with the exception of the Agricultural Building (by Mr. Masqueray), which was 1,700ft. long and from an exhibition point of view was the most successful internally. It was at night-time, when the innumerable electric lamps were lighted, that the effect of the buildings was best; then, indeed, the sight was wonderful. As to the oak dowels used for binding the timbers together, these became a source of real danger when they fell, and they did serious damage to some exhibits. Screw bolts would have been better.

Mr. Collard made special reference to the "staff" or fibrous plaster used. He championed this material, affirming that it was most permanent if painted and kept beyond the reach of people kicking or poking it with their umbrellas. Work which had been done with it at Earl's Court ten years ago—with a coat or two of paint every year—was to-day as good as ever. There was no decay. As to the binding material used, at Earl's Court hay had been employed by the Belgian plasterers and it proved excellent. Altogether as many as 1,000 plasterers were working there at one time, of all nationalities, and Mr. Collard said he found the Belgians to be the quickest and cheapest. Speaking of the cost of exhibition buildings, he said that the Empress Theatre at Earl's Court, including seating for 7,000 to 10,000 people, machinery, brickwork blocks for performers, &c., worked out at 2d. per ft. cube. The ordinary temporary buildings averaged from ¾d. to 3d. per ft. cube.

Mr. Banister Fletcher contrasted the St. Louis Exhibition with those of Paris, where he said the idea had been to do something novel; and it seemed a great pity that at St. Louis a similar motive had not prevailed. At Paris iron and terra-cotta were the materials used; at St. Louis all was of timber, and he thought something might have been made of that fact by an endeavour to evolve a timber architecture.

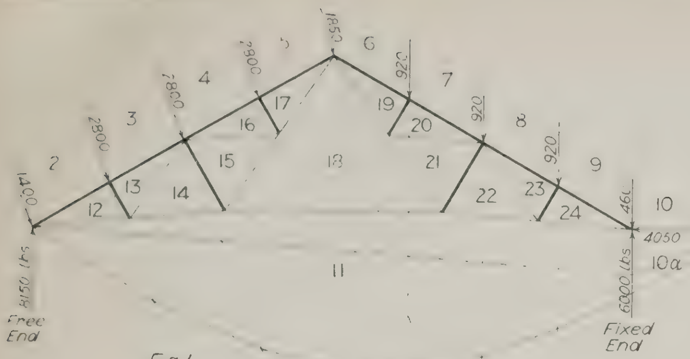


Fig. 1

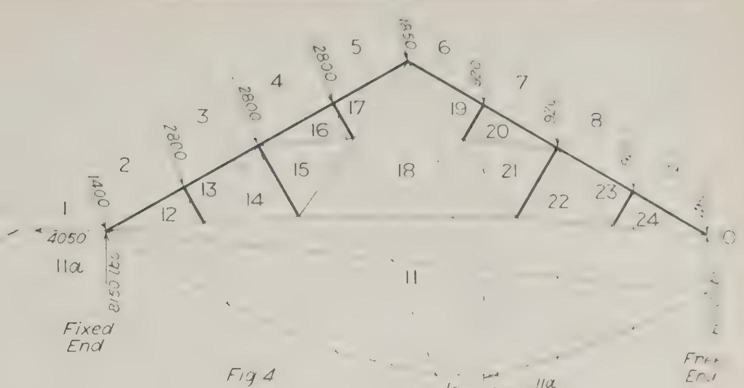


Fig. 4

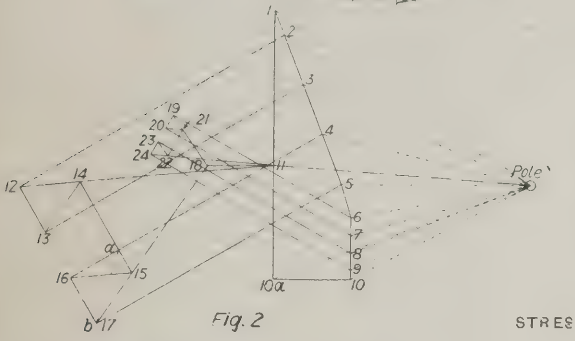


Fig. 2

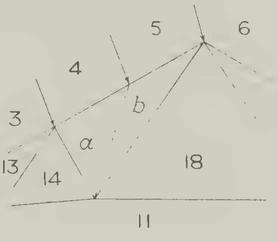


Fig. 3

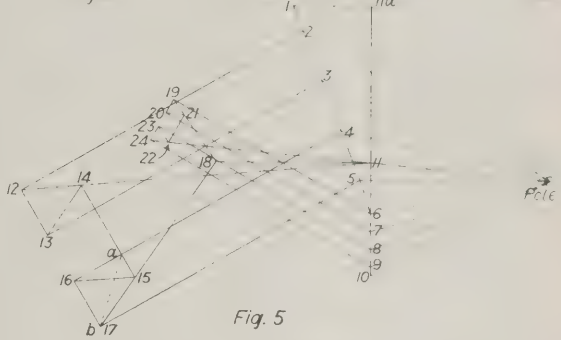


Fig. 5

STRESSES IN ROOF TRUSS.

Bar.	Wind left.		Wind right.		Maximum Stresses.	
	Fixed right.	Fixed left.	Fixed right.	Fixed left.	Tension.	Compression.
2-12	+16000	+17000	+13250	+12100	—	17000
12-11	−13400	−18300	−11600	− 6450	18300	—
12-13	+ 2750	+ 2750	+ 800	+ 800	—	2750
3-13	+15600	+16500	+12800	+11650	—	16500
13-14	− 3200	− 3200	− 950	− 950	3200	—
14-11	−10200	−15150	−10600	− 5600	15150	—
14-15	+ 5500	+ 5500	+ 1600	+ 1600	—	5500
15-18	− 6900	− 7450	− 2900	− 2300	7450	—
15-16	− 3200	− 3200	− 950	− 950	3200	—
16- 4	+15150	+16050	+12350	+11200	—	16050
16-17	+ 2750	+ 2750	+ 800	+ 800	—	2750
17- 5	+14700	+15600	+11900	+10750	—	15600
17-18	−10100	−10600	− 3900	− 3200	10600	—
18-11	− 3500	− 8100	− 8100	− 3500	8100	—
18-19	− 3200	− 3900	−10600	−10100	10600	—
6-19	+10750	+11900	+15600	+14700	—	15600
19-20	+ 800	+ 800	+ 2750	+ 2750	—	2750
7-20	+11200	+12350	+16050	+15150	—	16050
18-21	− 2300	− 2900	− 7450	− 6900	7450	—
20-21	− 950	− 950	− 3200	− 3200	3200	—
21-22	+ 1600	+ 1600	+ 5500	+ 5500	—	5500
22-11	− 5600	−10600	−15150	−10200	15150	—
22-23	− 950	− 950	− 3200	− 3200	3200	—
8-23	+11650	+12800	+16500	+15600	—	16500
23-24	+ 800	+ 800	+ 2750	+ 2750	—	2750
9-24	+12100	+13250	+17000	+16000	—	17000
11-24	− 6450	−11600	−18300	−13400	18300	—

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

Approval of Plans by Local Authorities.

SCARBOROUGH.—F. A. T. writes: "Your answer to my enquiry on p. 136 of your issue for March 15th does not deal with the power of a local authority to approve plans conditionally. I think it is a strong point as to whether they must reject or approve. I should like to hear your views on the subject."

Section 158 of the Public Health Act, 1875, plainly gives the sanitary authority no power of conditional acceptance of plans. They must either be approved or disapproved within one month. It may also be useful to point out that a local authority empowered to make by-laws for the regulation of buildings within its jurisdiction has no power to sanction plans in contravention of by-laws properly made. F. S. I.

Stresses in Roof-Truss.

STREATHAM.—P. F. writes: "Please give the stress diagram and show direction of lines of reaction for the truss of which tracing is sent. The point of difficulty is the effect of the free and fixed ends."

This truss has other difficulties besides those found by querist. Fig. 1 shows frame diagram of the truss with wind on one side and the foot of truss on that side free to move, the other foot of truss being fixed. Draw the load-line, Fig. 2, 1 to 10, 10 to 10*a*, and 10*a* back to 1; select a pole, draw vectors, and parallel to these draw funicular polygon in Fig. 1 to obtain point 11 in Fig. 2; then proceed with the stress diagram. All goes well until point 15 is wanted; there are then various methods that may be adopted. One of the best is to alter the trussing in the frame diagram temporarily by putting substituted members, as in Fig. 3. Then 4*a* — 14*a* fixes point *a* in stress diagram, 5*b*—*ab* fixes point *b*. The *b* will be 17, 4—16 will pass through *a* cut off by 17—16, and 14—15 will pass through *a* terminated by 18—15. The truss being fixed on one side only, the horizontal thrust will be equal to the horizontal component of all the inclined forces, and the free side being next the wind the truss will tend to close up. If, on the other hand, the truss is free on the side furthest from the wind, the truss will tend to spread more. In practice the truss may be fixed on one side only, but the wind may be one side or the other. Taking the wind on the opposite side, the frame diagram will be as Fig. 4 and the stress diagram as Fig. 5. Fig. 3 will apply equally to this case. Then, for the design a table must be drawn up as shown above, and the scantlings calculated from the maximum stresses.

HENRY ADAMS.

Ordnance Surveyors.

ORPINGTON.—ORDNANCE writes: "(1) Is it possible for a person like myself, having had a training in an architect's and surveyor's office, with an average knowledge of surveying, to obtain a position as surveyor on the Ordnance Survey? (2) What extent of surveying knowledge is required? (3) What salaries are paid?"

The major portion of the Ordnance Survey work is performed by the Royal Engineers, and the opening for civilians has never been a great one. The work of the subordinate surveyors is almost purely mechanical, and the pay but small. I much doubt whether at the present time civilians are engaged for this purpose, but you might address a letter of enquiry—on foolscap paper—to the Director General, Ordnance Survey Department, Southampton. F. S. I.

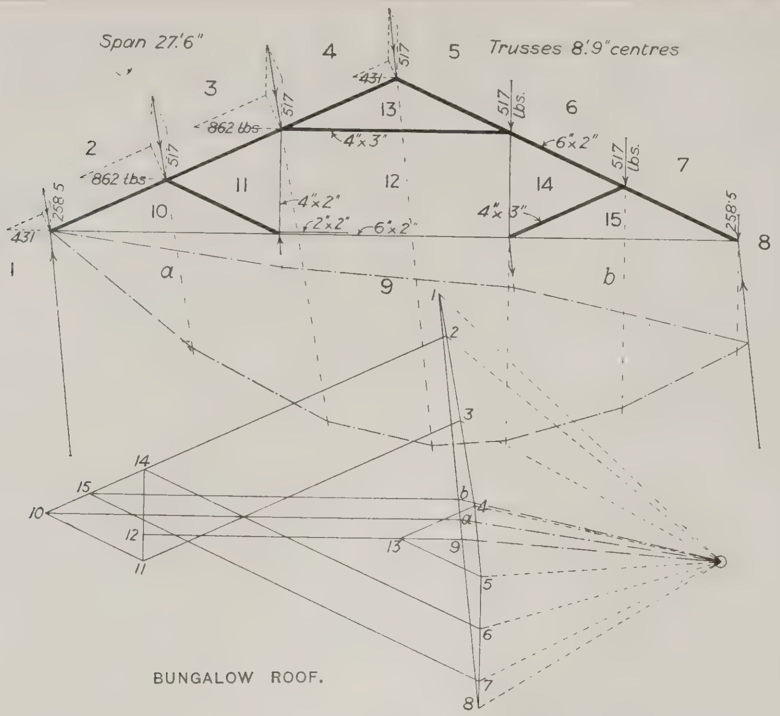
Woodsome Hall, Yorks.

OLDHAM. — SUBSCRIBER writes: "Please give particulars of Woodsome Hall, Huddersfield."

Woodsome Hall is the property of the Earl of Dartmouth. The house is built around an inner court, and the ground plan is given in the "Yorkshire Archæological Journal," vii. 509. The date is generally supposed to be the sixteenth century and additions in 1600. John Kaye probably built the oldest parts of the house before 1500, but the bulk was rebuilt or re-faced about 100 years later. M.

Valuation of Pipes.

C. B. writes: "I have been asked to value the interests of a private company in the pipes and other materials belonging to them, which are to be taken over by the local authority, and am in some doubt as to the principles which should guide me in the valuation. Of course a good deal depends on the state of the pipes when examined, but, besides that, there must be a limit to



BUNGALOW ROOF.

the life of all plant. How would it do to ascertain the value of the various pipes, &c., as new, and deduct a percentage for every year the plant has been in use, extinguishing the whole value in, say, thirty years? Is there any literature dealing with the valuation of such subjects and laying down the principles on which such work should be done? Reports of contested valuations must exist, as the question must have been often debated. Where and how can those reports be obtained?"

Local circumstances may alter the case, but, speaking generally, cast-iron pipes laid in the ground will last fifty years, and their deterioration will be fairly constant throughout that time; therefore, a deduction of 2 per cent. off the prime cost, including cost of laying, for each year they have been in use would be about a fair result. Information as to the general principles of such valuations will be found in Matheson's "Depreciation of Factories and their Valuation" (Spon, 6s.) HENRY ADAMS.

Bungalow Roof.

NOTTINGHAM.—SCANTLING writes: "Will the scantlings shown on the accompanying sketch (not reproduced) be satisfactory for a bungalow roof-truss, the roof being covered with Italian iron, 24 gauge? The ceiling joists of the 14ft. 6ins. span room are stiffened by a 6ft. by 2ins. purlin, which takes support from the tie-beam and the two walls."

The arrangement would not be satisfactory; the nearest approach to it is the truss with stress diagram, shown above. Although apparently an ordinary queen-post truss, it has some support from partitions below. This is the very lightest truss that can be recommended even for galvanized iron roofing, and the addition of an inch to the thickness of all the members would not be extravagant. HENRY ADAMS.

R.I.B.A. Examination Fees.

DORSET.—A REGULAR READER writes: "What are the fees for the examinations of the Royal Institute of British Architects?"

Preliminary, £2 2s.; Intermediate, £3 3s.; Final, £4 4s.

Book on Electric Batteries and Motors.

SOUTH BANK.—W. S. A. writes: "Please name a book dealing with electric battery making for lighting purposes, also the constructing of motors and dynamos."

"Guide to Electric Lighting," by S. R. Bottone, 1s.; "Electric Motors" (S. R. Bottone).

Keystones.

A Memorandum on the Planning of Buildings for Technical Classes has been issued by the Board of Education.

For the new Library at Wrexham more than one hundred designs have been received. Mr. Willink is the assessor.

Prof. Beresford Pite has been nominated by the assessor (Mr. John Belcher, A.R.A.) as architect for the branch library at West Islington.

Rochester Technical Institute Competition.—The Competition Reform Society is pleased to state that the conditions in this competition have been revised, and now recommends the same as satisfactory.

A new Building Department at the Leeds Institute will come into operation next session. It will be under the direction of Mr. James Neill, teacher of building construction at the Institute.

Ghizeh Pyramid struck by Lightning.—On April 1st the minor pyramid of Ghizeh was struck by lightning slightly below the apex. Several of the immense stone boulders of which the pyramid is built were dislodged, and rolled down with a terrific crash on to the sands below.

Scarborough's new Marine Drive.—The report of Mr. James Walker, engineer to the River Tyne Commissioners, states that the new sea-wall at Scarborough was very severely shaken by the gale of January 7th and is at present in the first stage of disintegration in the section—about 540ft. in length—near the north end, and unless this section is at once thoroughly strengthened a severe storm may cause an actual break in the wall. Mr. Walker suggests, therefore, the construction of buttresses in concrete at an estimated cost of £8,000.

The Ancient Temples of Great Zimbabwe.—Mr. Richard N. Hall, F.R.G.S., lectured at the Regent Street Polytechnic and the Society of Arts last week on the ancient temples of Zimbabwe (Rhodesia), the existence of which seems to have been forgotten from mediæval times until 1868, and really not treated seriously by European archæologists till Dr. Karl Mauch examined them in 1871. The walls are of granite blocks without mortar or cement, and one peculiarity is that each has a batter back on both faces. It is believed that they date from 1100 B.C., or possibly somewhat earlier.

Competition for new Council School, Accrington.—The first premium (£50) has been awarded to Messrs. Fairhurst & Holt, of Blackburn, Manchester and Liverpool; the second (£25) to Messrs. Shaw & Vowles, of Burnley; and the third (£10) to Messrs. Sproat & Clayton, of Burnley.

The Transporter Bridge at Runcorn is now complete. The car, in addition to holding 300 passengers, takes traps and vans, and will accomplish the journey across the Mersey in $2\frac{1}{2}$ minutes. Its travelling weight is about 130 tons. The bridge has occupied about four years in building and has cost £130,000.

Spoiling Carisbrooke Church.—On behalf of the Society for the Protection of Ancient Buildings Mr. John Hebb, F.R.I.B.A., protests against the revived proposition to add a new chancel to the parish church at Carisbrooke as a memorial to the late Prince Henry of Battenberg. It is urged that the addition would spoil the appearance of the church, and is not needed for Divine worship.

Glasgow Technical College Architectural Craftsmen's Society.—At the ninth annual business meeting held last week the office-bearers for the ensuing year were elected as follows:— Honorary presidents, Professor Gourlay and Mr. W. H. Baxter; president, Mr. Colin Sinclair; vice-presidents, Mr. G. Herbertson and Mr. A. Wagstaff; secretaries, Mr. A. L. Currie and Mr. J. C. Reid; treasurer, Mr. D. Skinner. A strong and representative committee of fourteen was also elected.

The University College Architectural Society, which has recently been formed, held its first meeting on Thursday last, when Mr. B. O. Fricker read a paper on glass and its application to domestic glazing. The meetings will be held fortnightly, and all the papers will deal with practical subjects. The next paper will be by Mr. E. J. Fowler on "Architectural Leadwork," to be followed by one by Mr. A. C. Hobbs on "Reinforced Concrete." The secretary of the Society is Mr. E. J. Whitley.

The Aberdeen Art Gallery, opened on Saturday by Sir George Reid, is the outcome of a desire for a thorough teaching collection of casts arranged to show the history of sculpture from the Egyptian period. Examples of Assyrian, Greek, Græco-Roman, the schools of the Italian Renaissance, and French and German sculpture have been obtained, and a special court of Celtic work and a section for lettering have been set out. The total cost of casts and fittings has been £3,500, given by 160 subscribers, mostly citizens of Aberdeen. The architects of the building are Messrs. A. Marshall Mackenzie & Son.

Tibetan Architecture.—Speaking at the Royal Institution last week on "Tibet," Mr. Percy Landon, who accompanied Col. Younghusband's recent expedition, said that in architecture and art the Tibetans had been less affected by outside influence than any other nation. Their ignorance in some ways was extraordinary. They thought that the world was shaped like a shoulder of mutton, and that their country occupied about half the world's area. They had not realized the principle of the wheel or the arch, but, curiously enough, thoroughly understood the cantilever principle in their bridges. Their style of architecture was curiously like Switzerland, and they adopted the same method of placing large stones on their huts to keep the roofs from being blown off. Some of the walls of their forts had faggots piled on them in the form of a frieze. The most lasting impression he took away with him was of the "golden" roofs of some of the principal buildings of Lhasa. They were really of copper, and the glitter from them could be seen for many miles.

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Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, April 12th, 1905.

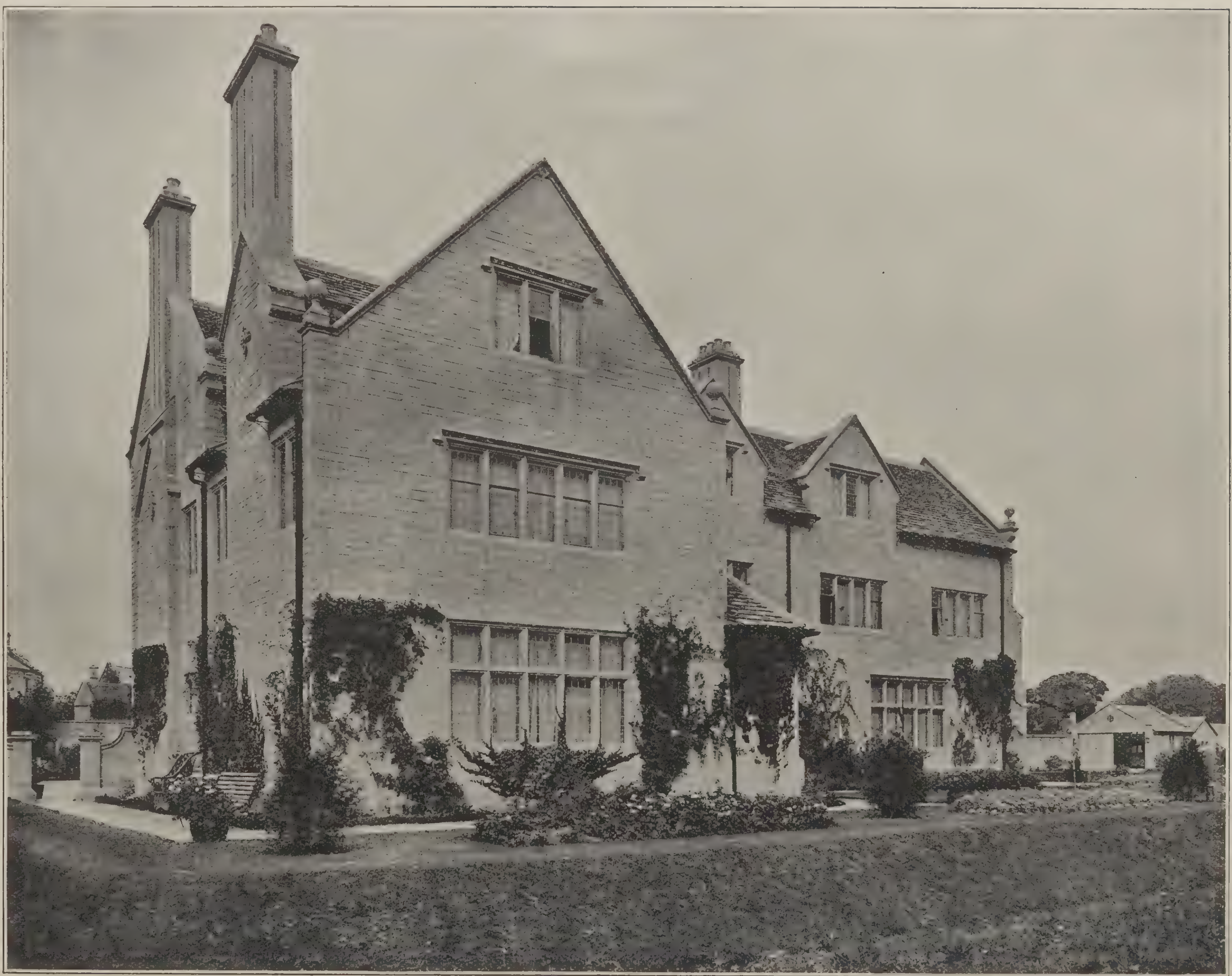

Photo: E. Dockree.

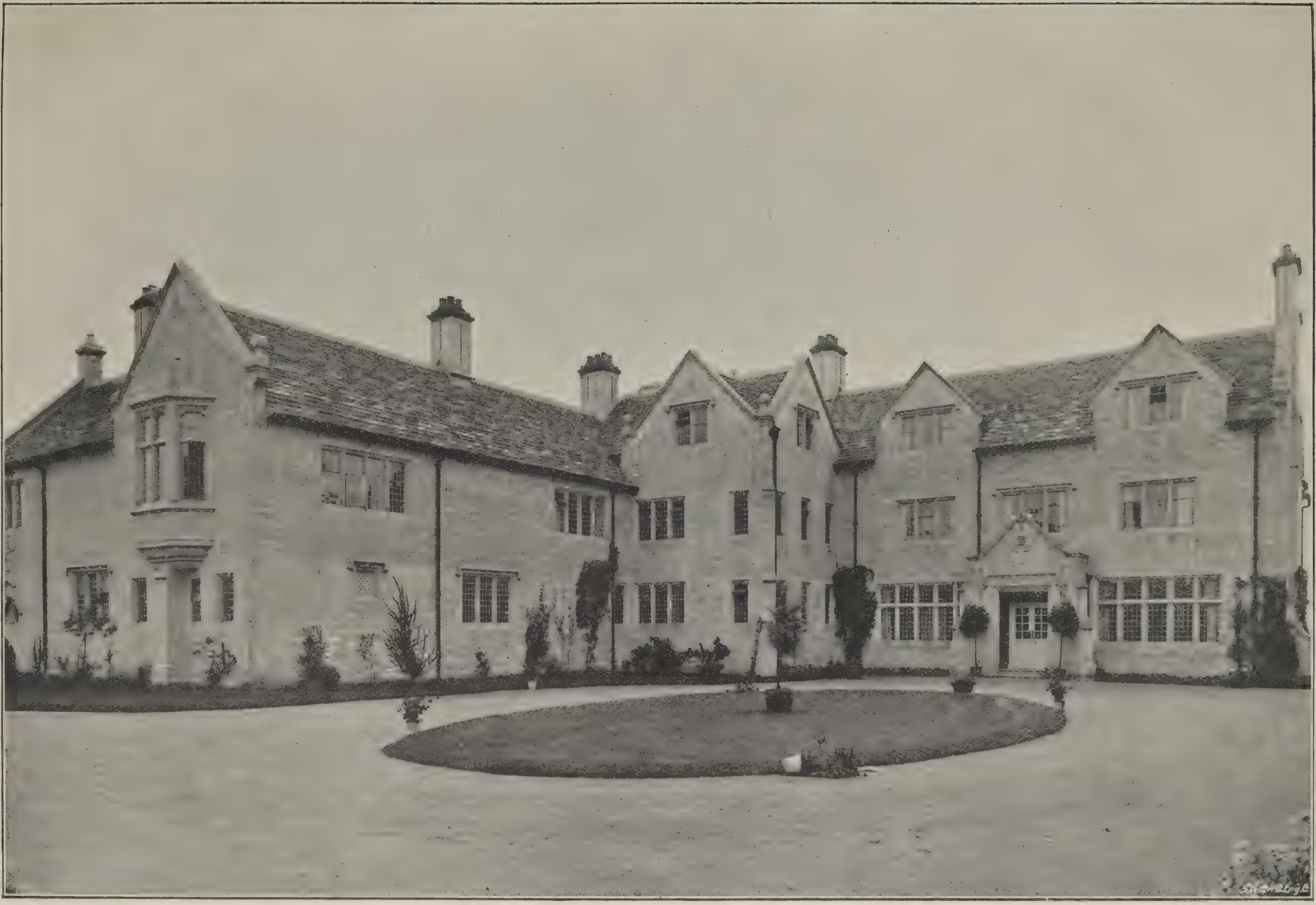

Photo: E. Dockree.

Winsley House, Wilts. Silcock and Reay, Architects.

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Correspondence.

Hagioscope at Stogumber Church.

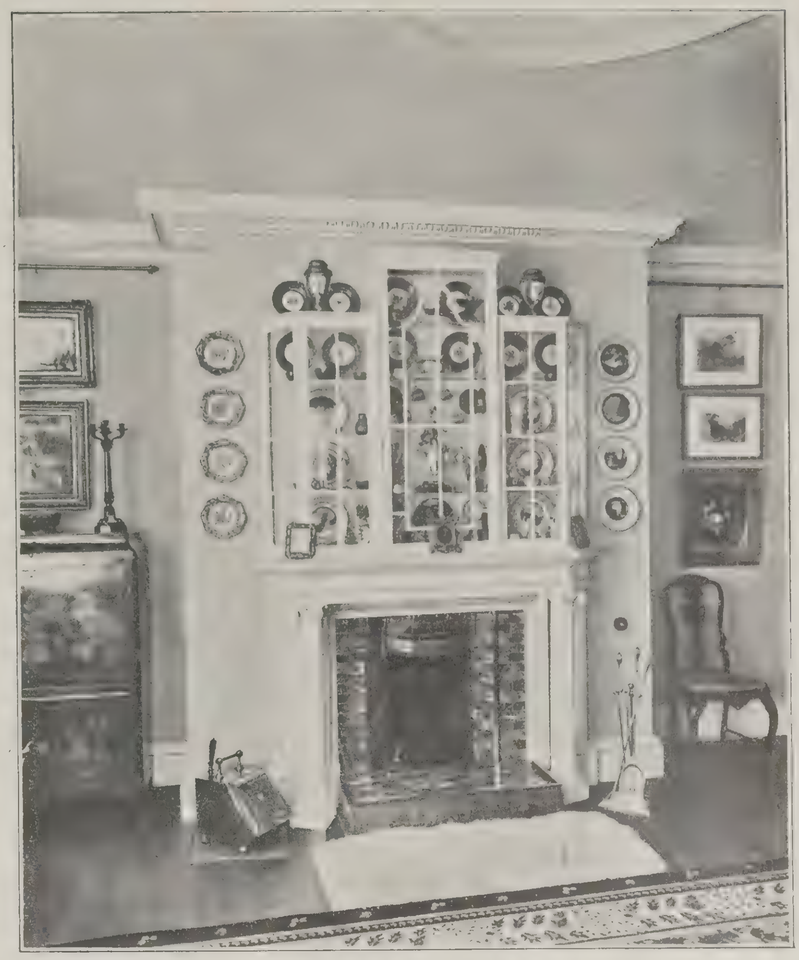
To the Editor of THE BUILDERS' JOURNAL.

SIR,—"G. A. T. M." in answering an enquiry about the above on p. 177 of your issue for last week infers that a Catholic would not participate in the Mass if he could not see the Host. This is not the case. It is only necessary to be one of the congregation to assist at Mass; just as I might truly assist at a Coronation in Westminster Abbey although, through being crowded into some corner, I were unable to see the royal personage. When it is impossible to see the altar and follow the Mass in that way, the worshippers are informed of the approach of the most solemn parts of the Mass by the ringing of a bell; nevertheless piety suggests that the altar should be seen if possible; hence the hagioscope.—Yours truly,

PORTSMOUTH. R. J. JENKINS.

THE LADY ARCHITECT.

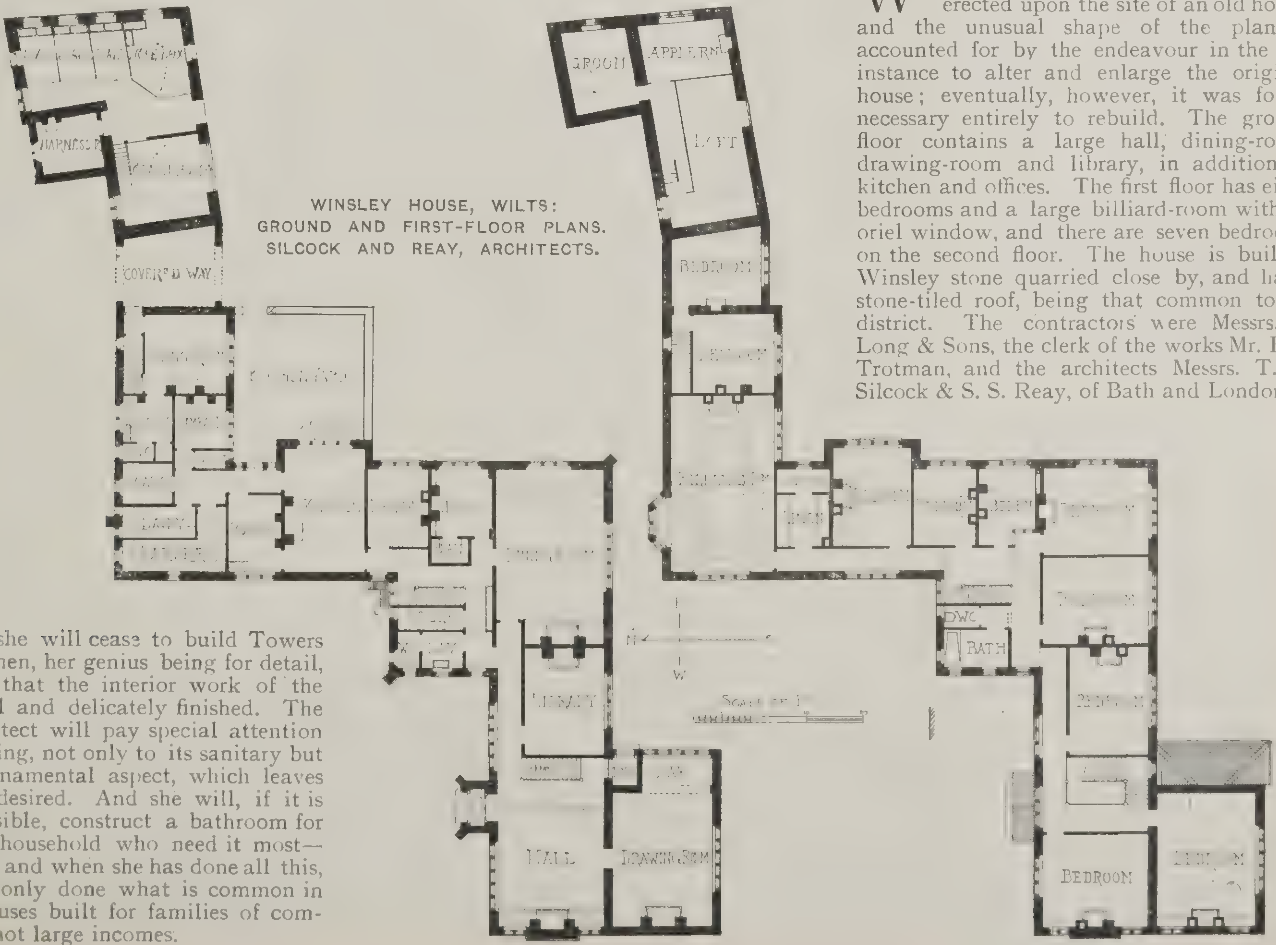
WRITING on architecture as a profession for women, Mrs. John Lane says in the "Outlook":—A woman has intuitions, and when she really does not know, it is her proud boast that she can guess, and, surely, that does quite as well. When she builds a house she will feel it, as a poet does his poem. She will put herself in the place of that other woman whose destiny it is to live there. She will create for her all the delightful things she wants herself. She will warm that house comfortably, because she herself hates to shiver. She will put in plenty of cupboards, because without cupboards life is not worth living (to a woman)! Her kitchen will be in just proportion to the size of the house, and not a kind of baronial hall in which even the beetles look lonely. Having pity on mere human legs, she will cease to build Towers of Babel. Then, her genius being for detail, she will see that the interior work of the house is well and delicately finished. The woman architect will pay special attention to the plumbing, not only to its sanitary but also to its ornamental aspect, which leaves much to be desired. And she will, if it is humanly possible, construct a bathroom for those of the household who need it most—the servants; and when she has done all this, then she has only done what is common in American houses built for families of comfortable but not large incomes.



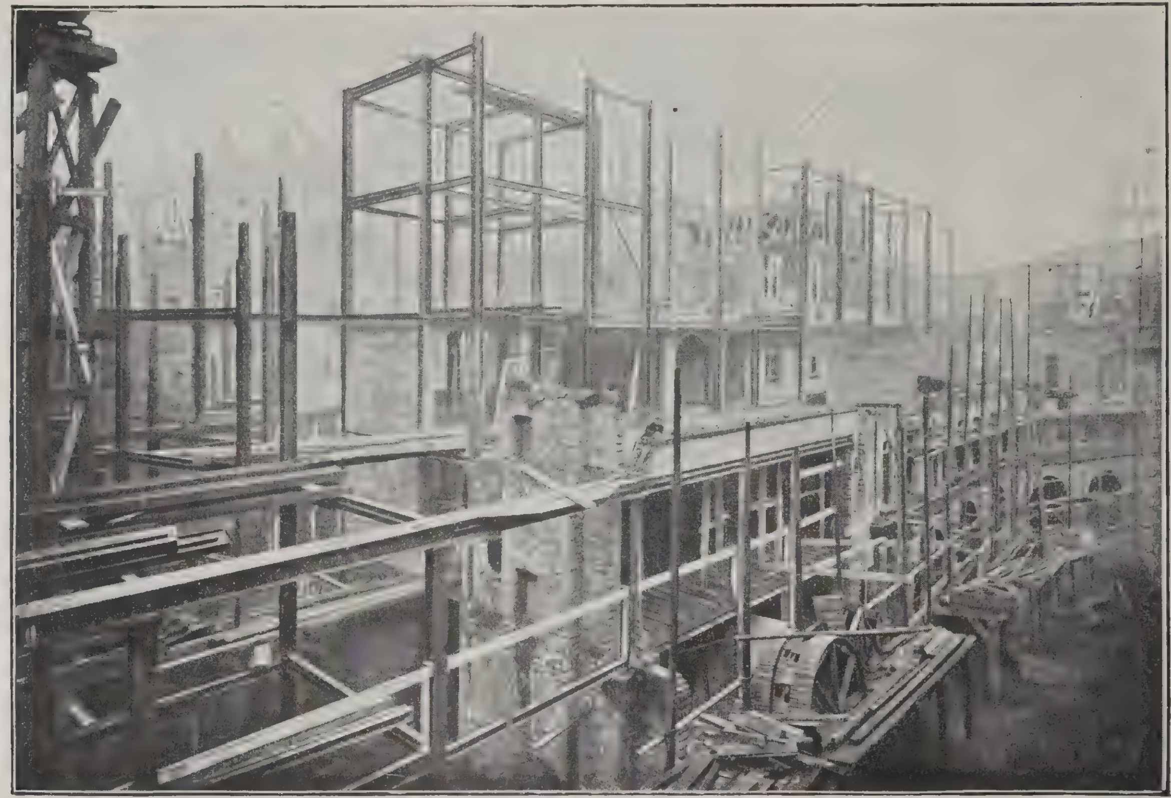
FIREPLACE IN DRAWING-ROOM, WINSLEY HOUSE. *(Photo: E. Dockree.)*

OUR PLATE.

WINSLEY HOUSE, WILTS, has been erected upon the site of an old house, and the unusual shape of the plan is accounted for by the endeavour in the first instance to alter and enlarge the original house; eventually, however, it was found necessary entirely to rebuild. The ground floor contains a large hall, dining-room, drawing-room and library, in addition to kitchen and offices. The first floor has eight bedrooms and a large billiard-room with an oriel window, and there are seven bedrooms on the second floor. The house is built of Winsley stone quarried close by, and has a stone-tiled roof, being that common to the district. The contractors were Messrs. J. Long & Sons, the clerk of the works Mr. E. J. Trotman, and the architects Messrs. T. B. Silcock & S. S. Reay, of Bath and London.



WINSLEY HOUSE, WILTS: GROUND AND FIRST-FLOOR PLANS. SILCOCK AND REAY, ARCHITECTS.

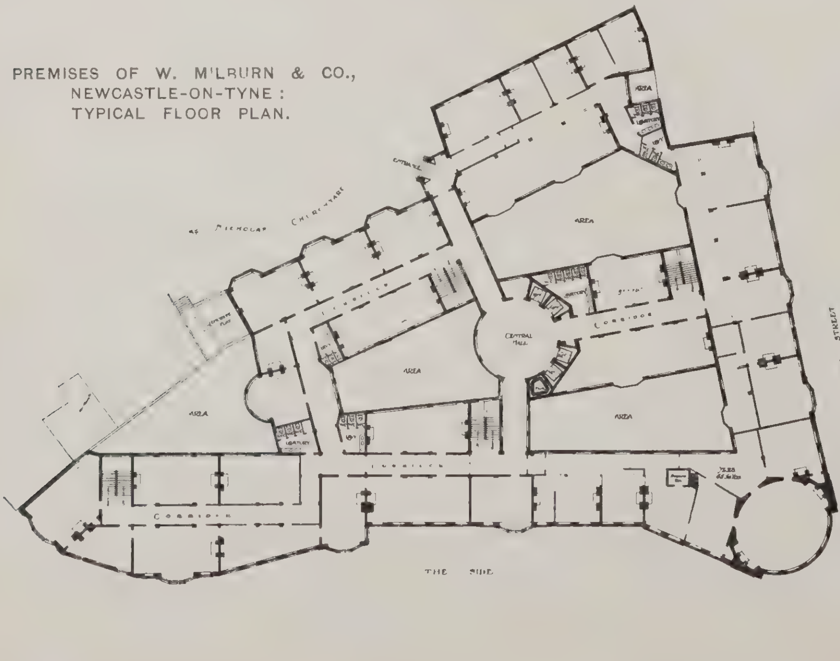


THE ERECTION OF NEW PREMISES FOR W. MILBURN & CO., NEWCASTLE-ON-TYNE. *(May, 1904.)*
OLIVER, LEESON & WOOD, ARCHITECTS.

A LARGE BLOCK OF OFFICE PREMISES.

MILBURN HOUSE, Newcastle-on-Tyne, of which a typical floor plan is here given, together with two photographs showing the building in course of erection, has frontages to three thoroughfares, namely, Dean Street, The Side and St. Nicholas's churchyard, in proximity to the quayside. As will be seen, the principle upon which this large block of office premises (covering nearly an acre of ground) has been designed consists of a central hall to which access is obtained by entrances in the centre of each front. In the hall are four lifts, and these, with three fireproof staircases placed in convenient positions, make the rooms readily accessible from all parts. The building has a steel frame with expanded metal and concrete floors, and brick and stone elevations with granite base. In all about 12,000 yds. super. of expanded steel and concrete flooring have been laid, the chief spans being 15ft. from centre to centre of bearing and the flooring 7ins. thick. The areas are faced with Opalite, and the corridors and staircases finished with tile dadoes. Where the structural steelwork is not enclosed by masonry it is encased in expanded metal and fire-resisting plaster. The entrances and central halls are panelled with oak-work. The whole has been executed by Mr. Stephen Easten, contractor, of Newcastle. The foundation-work was of a very serious nature, as may be inferred from the fact that some of it was carried to a depth of 70ft. below the level of the cathedral, which immediately adjoins the site, and quicksands had to be passed through to get to the boulder clay. The building stands upon a raft of expanded steel and concrete 3ft. thick. Messrs. Oliver, Leeson & Wood, of Newcastle-on-Tyne, were the architects.

PREMISES OF W. M'LBURN & CO.,
NEWCASTLE-ON-TYNE :
TYPICAL FLOOR PLAN.



IN PARLIAMENT.

(By Our Press Gallery Representative.)

THE following information has been recently given to members of the House of Commons by the ministers and departments concerned :—

South Kensington Museum: Date of Completion.

Mr. Coghill asked Lord Balcarres if he could say when the new buildings of the Victoria and Albert Museum in Cromwell Road were likely to be finished, and if efforts would be made to have them completed before the close of the present year; when the new wing of the Museum in the Imperial Institute Road would be opened; and how soon the temporary sheds which were now used for the purposes of the Museum between Prince's Gate and Queen's Gate could be dispensed with.

Lord Balcarres stated that the contract for the building of the Victoria and Albert Museum was to be finished in February, 1907. It was impossible to hasten the completion. Honourable members were perhaps not aware that the foundation-stone was laid by Her late Majesty's desire at a date considerably earlier than the works could be begun; hence much apparent delay. As regards the Royal College of Science in Imperial Institute Road, the building could not be ready for occupation before the spring of next year. None of the temporary sheds could be vacated until then at the earliest.

A West-End Area.

Mr. Coghill also enquired whether the Board of Works would consider the advisability of laying-out all the unoccupied portions of the area between Prince's Gate on the west, Queen's Gate on the east, and Prince Consort Road on the north as a public garden, as for a long time no other use had been made of it.

Lord Balcarres replied that the land to which Mr. Coghill appeared to refer was situated on the south side of Prince Consort Road, and was believed to be the property of the Commissioners of the Exhibition of 1851. The First Commissioner of Works did not know of any other unoccupied area in this vicinity which could be available for a garden.

Mr. Bonar Law informed Sir Thomas Esmonde that the cost of the outer or new harbour at Holyhead was £1,482,000.

Approaches to Houses of Parliament.

Mr. Akers Douglas stated, in reply to a question by Mr. Forde Ridley, that he had communicated with the Westminster City Council on the matter of road repairing at the approaches to the Houses of Parliament, and he was assured that as far as possible all repairs would be performed out of session.

Ventilation.

Lord Balcarres stated, in answer to Colonel Wyndham Murray, that it was anticipated that the works recommended by the select committee for improving the ventilation of the House of Commons would be completed by Easter, but experimental tests which were being continued might possibly necessitate further minor improvements.

THE ERECTION OF NEW PREMISES FOR W. MILBURN & CO., NEWCASTLE-ON-TYNE.
(September, 1904.)

Sir Ernest Flower asked whether it was proposed to carry out certain suggestions made by Dr. M. H. Gordon in his recent report on ventilation in the House of Commons, and whether these recommendations were in any way incompatible with or superseded by the scheme of ventilation now in use.

Lord Balcarres said the reply to the first question was in the affirmative. The recommendations were intended to improve the system now in use and were not incompatible with it.

Lifts in Hotels and Offices.

The Home Secretary, having had his attention called to the death of a young woman who lost her life through falling down a lift in a City hotel, informed Sir Thomas Dewar that the safe construction, arrangement and fencing of lifts were matters which were carefully attended to in factories, warehouses and other places coming under the Factory Act, but there were no powers, so far as he was aware, to deal with the matter in other places, such as hotels and offices. Legislation would be required for the purpose, which he was afraid he could not promise to undertake, but any proposals for giving local authorities the power of dealing with the matter would receive his careful consideration.

Rebuilding of Regent Street Quadrant.

In the House of Lords on April 7th Viscount Ridley asked His Majesty's Government whether the buildings now being demolished in the Quadrant of Regent Street had any defect which necessitated their removal; whether the sites on which they stood were under the control of His Majesty's Office of Woods and Forests; and whether in rebuilding on those sites His Majesty's Government would have due regard to the architectural continuity of Regent Street. He pointed out that in the opinion of the contemporaries of Nash that street was not well built, and there might be a reason for the demolition of those houses. But whether it was necessary to pull those houses down for architectural or other reasons, he wished to know if the Government would do their best to see that some architectural continuity, if not the exact façade as it appeared just now, was preserved in the rebuilding. He believed there was a parallel for such action in Paris, where, on the desire to build a large hotel in a certain part of the city becoming known, the French Government insisted that in the building of the hotel certain outside architectural features should be preserved. He hoped the British Government would deal with the English architect Nash as the French Government did with their architects. He did not know how far the London County Council had any authority but he was quite certain by the action of the County Council in other parts of London that they were in every way desirous of considering architectural features in the Metropolis. He hoped the Government would be able to give a satisfactory assurance that in the rebuilding on this site, where the work of demolition had gone so far that it could not be stopped, they would have due regard to one of the most important and interesting architectural features of London.

Lord Windsor, the First Commissioner of Works, replying on behalf of the Treasury, said the answer to the first question was that the buildings in the Quadrant and other parts of Regent Street were not considered suitable for modern requirements, were not for the most part well built, and did not utilize the sites which they occupied to the best advantage. It was therefore proposed to rebuild the Quadrant as the present leases expired, or earlier if suitable opportunities occurred. In reply to the second question, the ground belonged to H.M. Office of Woods and Forests. The answer to the third question was that it was intended to have regard to the continuity of architectural design. Mr. Norman Shaw had been requested to prepare a design, but this design had not yet been finally settled. It was the intention of the Commissioners to rebuild the Quadrant in one design, instead of having buildings of a patchy description. He did not think he could add any more to that information. He could only say that the Commissioners were fully aware, as it was necessary to rebuild the houses in the Quadrant, that they should be rebuilt to the designs of a well-known architect and with a view to the continuity of the buildings, and that the present curve of the Quadrant should be maintained.

ASSOCIATED PORTLAND CEMENT MANUFACTURERS' WORKS.

A VISIT to these works at Northfleet was made on Saturday by the Northern Polytechnic Building Students' Association. The works are of the most up-to-date description, only the latest machinery being used, which, besides many other improvements, does away with the storing of slurry in backs to dry, as in the old-fashioned way at many works. As an example of the space saved by this, it may be stated that whereas before the new plant was installed the works covered 8 acres, the present works only cover about 3 acres. The party was first shown the mills in which the chalk and clay in proper proportions are mixed, entering at one end of a row of mills and, passing on, being gradually freed from stones and lumps until at the end mill the slurry is forced through a sieve of 180 meshes to the square inch, whence it is pumped into large storage tanks and there kept in a continual state of movement to prevent settlement. From these tanks it is pumped into the rotary kilns, of iron, about 9ft. diameter and 50 feet long, lined internally with firebrick, with a furnace at one end. As the slurry is pumped in at the reverse end of the kiln to that of the furnace, it is gradually dried until it reaches the furnace, when it is burnt to a clinker. Only coal-dust is used in the furnace, forced in at high pressure. This gives a much cleaner and finer cement than in the old intermittent kilns. The clinker is gradually cooled by passing down chutes into trucks before being taken to the grinding room, where it first goes through tube mills having steel balls and then into other mills of about 4ft. or 5ft. diameter containing small pebbles. This gives a more finely-ground cement than with the old method of grinding between rollers. The noise in this building is something appalling, all communications having to be made by means of signs.

In the engine-house at the works are two triple-expansion engines connected direct to dynamos for supplying power to the whole of the plant. On the wharves are immense storehouses for cement, one of which was calculated to hold about 3,500 tons.

It was interesting to note barrels of cement being packed for a Government contract at Middlesburg, also 56lb. kegs for Sierra Leone, this weight being just sufficient for natives to carry on their heads from the surf boats.

PROF. PITE ON LONDON STREET PLANNING.

IN the paper on street planning which he read before the last meeting of the Royal Institute of British Architects Prof. Beresford Pite said that London was dotted over with picturesque elements which might be crystallized into characteristic and pleasing groups and arrangements. Each district had opportunities for the conservation of the interest of public places and thoroughfares which were not far to seek for the exercise of local patriotism. London had no need of the services of a Baron Haussmann to straighten her out.

The River Site.

In a very real sense the laying-out and planning of the city depended upon the sweep of the curves with which the river passed through London from the Palace of Greenwich to that of Fulham, and thus controlled the direction of the main thoroughfares on both banks from east to west. Englishmen were scarcely yet alive to the imperial grandeur of the Thames Embankments, more worthy of admiration than any scheme of avenues or streets that the world at present held.

Public buildings and national monuments could be more splendidly placed upon the banks of a broad river than on any other class of site, and London, without the enormous expense of forming new roadways and clearing thickly occupied areas for the purpose, was in possession upon the Thames of a series of situations for grand buildings which should awaken the public conscience to the existence of the delights architecture had the power to reveal.

Speaking of the bridges of London, Professor Pite said that the two distinct aspects of a bridge design were, first, that of its width, proportion and gradient as a thoroughfare viewed from above; secondly, that of its elevation viewed from below.

The new Temple Bridge.

When the necessary new bridge at the Temple appeared, might it be as fine as Westminster from above and as beautiful as Waterloo from beneath! It would occupy a majestic site in the grand curve of the Embankment, so that its perspective would grow and radiate as it was approached; and with Somerset House between it and Waterloo Bridge, and the great embankment below, a subject would be created not unworthy of some new English Piranesi.

Railways and the Bridges.

It was to be hoped that the fashion for bringing steam railways into cities would soon be over, and that invisible tubes would supply all the needs of rapid urban locomotion, while proper masonry bridges would replace the temporary and rusted-out toys of a past century for the accommodation of the now triumphant autocar across the Thames.

It was too late to lament the presence of the Thames railway bridges; but how fine a series of the termini of the three great southern lines, such as those which lay on the north of Euston and Marylebone Roads, would have been on the opposite bank, each approached by a fine passenger bridge from the city shore.

The Inroads on Regent Street.

Referring to Regent Street, Professor Pite said that it was inevitable that the course of nearly a century should make inroads upon the completeness of any human scheme; and it was fruitless to deplore the necessary alterations which renewed the face of progressive cities periodically. Regent Street, however, had a special claim to be considered as a whole, for it was such. The whole street had been laid out and built with a regal sense of dignified discipline, and it remained the property of the Crown. It was, therefore, greatly to be regretted that latterly rebuilding had been permitted to take place, just as if the street had no harmony to be broken or special character of its own.

Architects could not forget the charm of the portico of

Hanover Chapel,

one of the rare but perfect works of Professor Cockerell, which so happily and innocently projected over the footway, supported by graceful towers at the curved approach to Regent Circus.

Nor could they but regard the reasons urged for its removal as being entirely insufficient, or find solace for their grief in the contrast to all its architectural virtues which now vauntingly occupied its site.

A Complete Design Required.

Some complete design for preserving the proportions and character of the whole of this fine thoroughfare needed to be taken in hand in order that the inevitable effects of the now shortening tenures under the original leases in rebuilding might be met without reducing the streeet to such a wreck of its former self as had been achieved at Piccadilly Circus.

The lower portion of Regent Street and Waterloo Place itself were in some danger of falling a prey to partial rebuildings without unity of treatment as to proportion.

Londoners had expended some Philistinic wit upon

The Crimea Memorial,

but no one could deny the fineness of its monumental scale and the harmonious but quiet dignity of Waterloo Place itself. Was this also to be sacrificed?

In the removal of St. Philip's Church, Regent Street had been deprived of another refined and interesting front which had been placed with full regard for the buildings opposite and the proportions of the adjoining blocks. What would follow on its site?

Piccadilly Circus,

said Professor Pite, was a painful example of how in decadent times the primeval disregard of order reasserted itself. The revelation of the latter art of the nineteenth century comprised by the Pavilion and the vista of Shaftesbury Avenue, enshrining as a jewel in a swine's snout Mr. Gilbert's fountain, and by the comedy granite dome of the Strand Board of Works' convenience, presented altogether a contrast to the Quadrant, the County Fire Office and the remains of the design of the Circus that cried aloud for remedy. This absurd accumulation of mistakes should be courageously handled and removed.

The fear of traffic and the false economy in laying-out Shaftesbury Avenue and the resulting sites had spoilt Piccadilly Circus and dismembered Regent Street, but there were capabilities in the ruins for renewing something of the completeness of scheme which had been lost, and of providing a fine public space there of which we need no longer be grievously ashamed.

Whitehall and Parliament Square

were decidedly growing in architectural interest and picturesque beauty. The placing of great formal buildings upon a wide thoroughfare having a slight general curve and some variation in width was producing in the former some charming effects; while the interest of the Abbey flank, the Houses of Parliament, and St. Margaret's Church, so valuable a foil to its neighbours, increased by contrast with the very different buildings at the northern side, and there was still a frontage waiting for some able designer to treat it worthily before the western side behind the Canning statue.

The placing of the finer Classical Buildings

that London possessed upon informal and somewhat random surroundings was worthy of remark. St. Paul's would not gain by removal from the wonderful piling-up of buildings and spires which grouped with it on its approach from Fleet Street through Ludgate Circus, and the Royal Exchange, without its pell-mell of omnibuses and the accidental appearance of the Mansion House or shy retirement of the Bank into the background, would not be in London at all.

The Success and Character of London Street Planning

would appear to depend upon the provision of a fine building upon a site and in surroundings that were not architecturally ideal, the natural tendency to picturesqueness in a crowded city making amends by artistic accidents for the lack of rule and restriction required in the surroundings.

At South Kensington

a whole modern estate of great and costly buildings had recently sprung up on roads of magnificent width, without any such totality of effect as could without much difficulty have been obtained with the gardens on the north, Cromwell Road on the south, and Queen's and Prince's Gates west and east.

The buildings included the costly and wonderful Albert Memorial, the Albert Hall, Imperial Institute, Natural History and Victoria and Albert Museums—which were of the first magnitude—while the two Colleges of Science, the City and Guilds Institute, the College of Music and others were of impressive size.

The estate, however, had been futilely subdivided by two cross-roads, practically accommodating only two buildings apiece, and the rest were left to the outskirts facing the surrounding stucco mansions. No earthly view of this fine accumulation of first-rate modern buildings was practicable. Turning

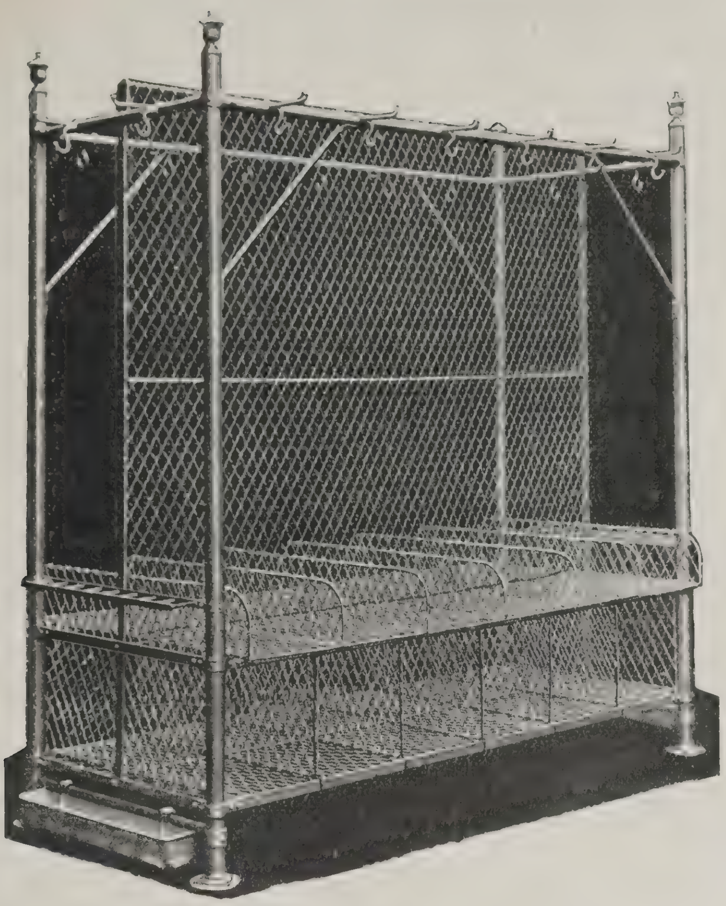
Eastwards to the Strand,

one found a great problem courageously handled and originated, but waiting for its fate at the hands of the builders. Could a street of such a width as 100ft. be fine if the sites and conditions were in character and scale with its breadth on one side of the street only? The difficulties would vanish if the providence of proportions from Regent Street were adopted here, and the scale would give value not only to the two lovely churches and to Somerset House but a healthy freedom for light and air in a central block of London atmosphere.

A Central Authority Needed.

Professor Pite concluded that the consideration of the subject before them led them naturally to look to the exercise of authority as necessary in all streets and public spaces laid out on formal and symmetrical principles, for the preservation of the character of the whole, and for the prevention of self-assertive individualism to the detriment of general amenity. Such authority could be most readily afforded by the County Council, probably acting through an architectural committee of advice, whose judgment could be allowed to decide upon the cases where the public interest demanded some regularity of treatment or otherwise.

Architects' Registration.—Last week Mr. Cross and Mr. Hubbard read their papers on architects' registration before the Edinburgh Architectural Association. Mr. G. A. T. Middleton also explained the provisions of the Bill. Mr. Henry F. Kerr said he doubted the practicableness of the proposed measure, and said that progress in raising the standard of the profession would be better made by encouraging the taking of the diploma of the Institute. Messrs. Robertson, Ross and M'Arthy commended the proposal on the ground that the profession suffered grievously from the competition of untrained and unskilled men; and although no resolution was put, this was the feeling of the meeting.—At the ninth annual meeting of the Three Towns branch of the Devon and Exeter Architectural Society (Mr. B. Priestley Shires, A.R.I.B.A., presiding) the annual report was read. This stated that registration had now assumed practical form and was being supported by the Institute and most of its societies.



A NEW FITMENT FOR CLOAK-ROOMS.

Trade and Craft.

A Fitment for Cloak-rooms.

The accompanying illustration shows a fitment for the cloak-rooms of institutions of a certain class. This, the first of its kind, was designed for the Winsley sanatorium by Messrs. Silcock & Reay, architects, of Bath, and the required number was made by Messrs. Brookes & Co., Ltd., of 4, Cateaton Street, Manchester, the makers of the "Schola" school hook, known probably to every architect in this country. As will be seen, the fitment has twelve compartments at the bottom for boots, over which are twelve trays for rugs, and over these again the hat and coat hooks, whilst at the ends are umbrella stands with drip trays. The fitments are self-contained and self-supporting, and the makers, who have registered the design, state that they were fitted together in their works and sent complete to their destination, only requiring to be carried to the cloak-rooms and placed in the desired positions. It is apparent from the photograph that the work is carried out with great neatness and attention to detail.

"Cyclone" Blowers.

We may quote Messrs. Matthews & Yates' words that it pays to instal a fan for increasing the draught where a chimney is doing the work, and it pays better still to do so in new plants before a chimney is built, because the bulk of its cost can then be saved and many other economies can be effected. For those who want full particulars of plant for this purpose we can recommend perusal of the excellent pamphlet on "Cyclone" blowers which Messrs. Matthews & Yates have just issued. These blowers are also much in use for the collection of shavings and sawdust in woodworking shops and elsewhere.

Coming Events.

Wednesday, April 12.

ROYAL SANITARY INSTITUTE. — Inspection and Demonstration at the East London Soap Works, Bow, at 3 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION. — Annual Business Meeting and President's Valedictory Address, at 8 p.m.

ARCHITECTURAL ASSOCIATION (Discussion Section). —Mr. A. Needham Wilson on "Village Churches," at 7.30 p m.

QUANTITY SURVEYORS' ASSOCIATION.—Mr. A. G. Cross, F.S.I., on "The Practice of our Profession and Suggested Reforms," Freemasons' Tavern, Great Queen Street, W.C., at 7 p.m.

Thursday, April 13.

INSTITUTION OF CIVIL ENGINEERS.—Students' Visit to the Northolt and High Wycombe line of the G.W. and G.C. Railways, in course of construction.

INSTITUTION OF MECHANICAL ENGINEERS. — Anniversary Dinner at the Hotel Cecil, London.

SOCIETY OF ARCHITECTS.—Mr. A. K. G. Bamber (Managing Director, The Associated Portland Cement Manufacturers (1900), Ltd.) on "The Manufacture and Testing of Portland Cement," at 8 p.m.

Friday, April 14.

INSTITUTION OF MECHANICAL ENGINEERS.—Presidential Address. Discussion on Steam-engine Research Report.

Saturday, April 15.

ROYAL SANITARY INSTITUTE.—Provincial Sessional Meeting. Discussion at Liverpool University on "Recent Methods of Re-Housing Tenants dispossessed from Insanitary Property," at 11 a.m.

ARCHITECTURAL ASSOCIATION. — Seventh Spring Visit to Hammersmith Free Library (Mr. Henry T. Hare, architect), at 3 p.m.

Monday, April 17.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.— Mr. Mervyn Macartney on "Garden Architecture," at 8 p.m.

Wednesday, April 19.

ROYAL SANITARY INSTITUTE. — Inspection and Demonstration at Harrison & Barber's Knacker Yard, Winthrop Street, Whitechapel, E., at 3 p.m.

INSTITUTE OF SANITARY ENGINEERS. — Finance Committee at 3 p.m. Organizing Committee at 5 p.m. Sessional Meeting at 7 p.m. Paper by Mr. E. R. Palmer.

April 21 25.

ARCHITECTURAL ASSOCIATION (Camera and Cycling Club).—Easter Excursion to Hereford. Names to be sent in to Mr. G. H. Lovegrove, 18, Foxgrove Road, Beckenham, by April 13th.

Saturday, April 22.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to Drum House, Gilmeston.

Current Market Prices

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0	1	3	0
Clover, best	per load	3	15	0	4	2	6
Hay, good	do.	3	10	0	3	15	0
Sainfoin mixture ...	do.	3	10	0	3	17	6
Straw	do.	1	12	0	2	0	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ...	per cwt.	1	0	5		—	
Colza Oil, English ...	do.	1	2	3		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0		—	
Linseed Oil, barrels ...	per cwt.	0	17	$1\frac{1}{2}$		—	
Petroleum, American ...	per gal.	0	0	$5\frac{1}{8}$			
Do. Russian ...	do.	0	0	$4\frac{3}{8}$		—	
Pitch	per barrel	0	8	0		—	
Shellac, orange	per cwt.	7	10	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	4	0		—	
Tar, Stockholm	per barrel	1	6	6		—	
Turpentine	per cwt.	2	4	0		—	

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ...	per ton	82	0	0		—	
Iron, Staffs., bar ...	do.	5	17	6	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	5	0		—	
Lead, pig. Soft Foreign...	do.	12	13	9		—	
Do. do. English common brands	do.	12	18	9		—	
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14	0	0		—	
Do. pipe	do.	15	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	5	0		—	
Do. floor brads... ...	do.	9	0	0		—	
Steel, Staffs., Girders and Angles	do.	5	5	0	6	0	0
Do. do. Mild bars ...	do.	6	0	0	6	5	0
Tin, Foreign	do.	141	10	0	142	0	0
Do. English ingots ...	do.	137	10	0	139	0	0
Zinc, sheets, Silesian ...	do.	28	0	0		—	
Do. do. Vielle Montaigne	do.	29	0	0		—	
Do. Spelter	do.	23	10	0	23	16	3

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Whitewood, American, logs.	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	3	0
Fir, Dantzic and Memel	per load	2	7	6	4	15	0
Pine, Quebec, Yellow ...	do.	4	5	0	7	5	0
Pine, Pitch, American ...	per load	2	8	0	5	15	0
Laths, log. Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, Archangel, White, 2nd, 3×9	per std.	9	10	0		—	
Do. do. Yellow, 4th, 3×9	do.	8	15	0	9	[illegible]	
Do. do. do. Unsorted, 3×11	do.	7	15	0		—	
Do. do. do. do. 3×9	do.	8	0	0		—	
Do. Keret, Yellow, 2nd, 3×9	do.	13	10	0			
Do. St. Petersburg, Yellow, 1st, 3×9	do.	12	0	0			
Do. Mesane, Yellow, 1st, 3×9	do.	20	0	0			
Do. Kovda, Yellow, 4th, 3×9	do.	8	15	0			
Do. Nederkalix, Yellow, 1st, 3×8	do.	10	0	0			
Do. Saguenay, Spruce, 3rd, 3×9	do.	8	15	0		—	
Do. Quebec, Spruce, 2nd, 3×9	do.	9	10	0		—	
Do. do. Bright Pine, 3rd, 3×11	do.	11	0	0		—	
Do. do. Red, do. Unsorted, $2\frac{1}{2}$×7	do.	8	10	0			
Do. Montreal Bright Pine, 1st, 3×11×12ft.×13ft. ...	do.	22	10	0			
Do. do. do. do. 3×11×16ft.	do.	22	5	0			
Do. do. do. do. 3×11×15ft.	do.	22	0	0	22	5	[illegible]
Do. do. do. do. 3×11×14ft.	do.	21	15	0			
Do. do. do. 3rd, 3×11×13ft.	do.	11	0	0			
Do. do. do. 4th, 3×11×16ft.	do.	8	5	[illegible]			
Battens, all kinds ...	do.	6	5	0	13	10	[illegible]
Flooring Boards 1in. prepared, 1st... ...	per square	0	10	0	0	10	
Do. 2nd	do.	0	7	9	0	10	6
Do. 3rd, &c.	do.	0	6	3	0	8	6

HARD WOODS.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	4	0	0	7	10	0
Birch, New Brunswick...	do.	2	10	0	5	[illegible]	
Do. Quebec do. ...	do.	2	10	0	6	0	0
Box, Turkey	per ton	7	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	$3\frac{1}{2}$	0	0	$3\frac{1}{2}$
Do. Honduras ...	do.	0	0	3		—	
Do. Tobasco	do.	0	0	4[illegible]		—	
Elm, Quebec	per load	4	2	6	8	15	0
Jarrah, planks	per ft. cu.	0	2	6	0	3	[illegible]
Mahogany, Average Price for Cargo, Honduras...	per ft. sup.	0	0	$4\frac{7}{32}$	0	0	[illegible]
Do. African ...	do.	0	0	$2\frac{31}{32}$		—	
Do. St. Domingo	do.	0	0	4		—	
Do. Cuba ...	do.	0	0	3[illegible]		—	
Do. Lagos ...	do.	0	0	4		—	
Do. Benin ...	do.	0	0	$2\frac{21}{32}$		—	
Do. Tobasco ...	do.	0	0	$5\frac{1}{16}$		—	
Oak, Wainscot	per log.	2	12	6	5	15	0

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
April 13	New Longton—Alterations to School	——	Swindells & Rawcliffe, 26 Fishergate, Preston.
,, 13	Ossett, Yorks—Shop, &c.	——	J. Kirk & Sons, Dewsbury.
,, 14	Preston, Lancs—Extension of Fire-station Buildings	Corporation	Borough Surveyor, Town Hall, Preston.
,, 14	Llanharan, Wales—Police Station	Joint Committee	County Surveyor's Office, Bridgend.
,, 14	Swindon—School	Education Committee	W. Seaton, Education Office, Town Hall, Swindon.
,, 14	Cwmbach, Wales—Twenty-eight Houses	Building Club	Morgan & Elford, 42 Canon Street, Aberdare.
,, 14	Truro—Classrooms	——	Sampson Hill, Green Lane, Redruth.
,, 14	Ulverston—House	——	Settle & Brendrit, Ulverston.
,, 15	Mountain Ash—135 Houses	Napier Building Club	Morgan & Elford, 42 Canon Street, Aberdare.
,, 15	Lancaster—Wall	Streets Committee	Borough Surveyor's Office, Town Hall, Lancaster.
,, 15	Creegbrose, Cornwall—Piggery	——	G. Oliver, Creegbrose.
,, 15	Bubwith, Yorks—Alterations to School	Education Committee	Clerk of Works, Beverley.
,, 15	Bangour, Edinburgh—Houses	District Lunacy Board	H. J. Blanc, 25 Rutland Square, Edinburgh.
,, 15	Spennymoor—Police Station	——	County Surveyor's Office, Shire Hall, Durham.
,, 15	Abertaf, Abercynon, Wales—School	Mountain Ash U.D.C.	W. G. Thomas, Public Offices, Mountain Ash.
,, 15	Boston, Lincs—Infirmary, &c.	Guardians	James Rowell, Church Lane, Boston.
,, 15	Denbigh—Asylum Buildings	Visiting Committee	T. M. Lockwood & Sons, Foregate Street, Chester.
,, 15	Epsom—Farm Buildings	Asylums Committee	Acting Clerk of Committee, 6 Waterloo Place, London, S.W.
,, 15	West Hartlepool—Three Houses	Mr. N. B. Kloed	F. E. Boez, York Road, West Hartlepool.
,, 17	Portsmouth—Reinstating Showroom	——	Borough Engineer's Office, Town Hall, Portsmouth.
,, 17	London, N.—School	Tottenham Education Committee	G. E. T. Lawrence, 22 Buckingham Street, Strand.
,, 17	Erith—Public Library	Urban District Council	W. Egerton, 12 Queen's Road, Erith.
,, 17	Fulford, Yorks—Three Houses	Mr. G. Wood	A. H. Everist, 8 New Street, York.
,, 17	Gorseinon, Swansea—Institute	Trades and Labour Council	C. T. Ruthen, Bank Chambers, Heathfield Street, Swansea.
,, 17	Johnstone, N.B.—Hospital Extensions, &c.	Joint Committee of Fever Hospl.	A. Leitch, 40 St. Enoch Square, Glasgow.
,, 17	St. Albans—Swimming Baths	Corporation	City Surveyor, Victoria Street, St. Albans.
,, 17	Ramsgate—Conversion of "Effingham" into Fire-brigade Station.	Corporation	T. G. Taylor, Albion House, Ramsgate.
,, 17	Lewes, Sussex—Offices	Education Department	County Surveyor's Office, County Hall, Lewes.
,, 18	London, E.C.—Town Hall Restoration	Shoreditch Borough Council	Town Clerk, Town Hall, Old Street, E.C.
,, 18	Pontygwaith, Wales—Fifty Houses	Penrhyn Isaf Building Co., Ltd.	W. D. Morgan, Victoria Chambers, Pentre.
,, 18	St. Bees, Cumberland—Chapel, &c.	——	J. F. Curwen, Architect, Kendal.
,, 18	Ashton-in-Makerfield—Infectious Diseases Hospital Extension.	Urban District Council	Albert Sykes, Clerk to Council, Ashton-in-Makerfield.
,, 18	Tonyrefail, Wales—Chapel	English Baptist Church	G. Hughes, Gilfach Road, Tonyrefail.
,, 19	Hemsworth, Yorks—Additions to Workhouse	Guardians	T. H. Richardson, Hemsworth.
,, 20	Penponds, near Redruth—Vicarage	——	Vicarage, Penponds.
,, 21	Askrigg, Yorks—Hall	——	James Skidmore, Askrigg.
,, 22	Alnwick—Bridge Works	Rural District Council	Council Office, Fenkle Street, Alnwick.
,, 24	Askam-in-Furness—House	Urban District Council	Council's Building, Station Road, Dalton-in-Furness.
,, 26	King's Norton—Library	Urban District Council	A. W. Cross, 23 Valentine Road, King's Heath.
,, 27	Gateshead—Stables	——	N. P. Pattinson, Town Hall, Gateshead.
,, 27	Keighley—Alteration to Court-house	Standing Joint Committee	J. Vickers Edwards, County Hall, Wakefield.
May 1	Rochester—Technical Institute	Corporation	W. Banks, City Surveyor, Rochester.
No date	Dromara, Ireland—Additions to Church and School	Committee of 2nd Presbyterian Church.	Hobart & Heron, Scottish Provident Buildings, Belfast.
	ENGINEERING:		
April 15	Boston, Lincs—Heating Buildings, &c.	Guardians	J. Rowell, Church Lane, Boston.
,, 15	Cork—Extension of Pier	County Council	E. Callanan, Secretary, County Council, Court House, Cork.
,, 15	Montreal, Canada—Pumping Plant	Water and Power Co.	Company's Offices, 62 Alliance Buildings, 107 St. James's St., Montreal.
,, 17	Glasgow—Boilers, &c.	Trustees of Clyde Navigation	G. H. Baxter, 16 Robertson Street, Glasgow.
,, 17	Foffamgreagh, Ireland—Reservoir	Joint Water Board	R. A. Dorman, Court House, Armagh.
,, 17	London, N.—Bacteria Beds	Hornsey Town Council	E. J. Lovegrove, 99 Southwood Lane, Highgate N.
,, 17	Cardiff—Switchboards, &c.	Corporation	A. Ellis, Central Office, The Hayes, Cardiff.
,, 17	Erith, Kent—Wiring of Car Depôt, &c.	Urban District Council	C. H. Fry, Council Offices, Bexley Road, Erith.
,, 17	Glasgow—Electricity Generating Plant, &c.	Trustees of Clyde Navigation	G. H. Baxter, 16 Robertson Street, Glasgow.
,, 18	Llantrisant, Wales—Waterworks, &c.	Rural District Council	G. S. Morgan, School Street, Pontyclun.
,, 18	Mitcham, Surrey—Gasholder	District Gaslight Co.	Company's Works, Mitcham.
,, 19	Aberdeen—Condenser	Electricity Department	J. A. Bell, Corporation Electricity Works, Millburn Street, Aberdeen.
,, 19	Merthyr Tydvil—Waterworks	Urban District Council	G. F. Deacon, 16 Great George Street, Westminster, S.W.
,, 19	Cornworthy, Devon—Water-piping, &c.	Rural District Council	Mr. Farley, Globe Inn, Cornworthy.
,, 26	Croydon—Pumping Plant	Town Council	G. F. Carter, Town Hall, Croydon.
,, 26	Stockport—Generator	Gas and Electricity Committee	A. J. H. Carter, Electricity Works, Millgate, Stockport.
,, 27	Manchester—Construction of New Curve	Cheshire Lines Committee	H. Blundell, Engineer, Central Station, Liverpool.
,, 28	Llandebie and Ammanford—Water-supply Works	Urban District Council	H. H. Brynmarlais, Ammanford.
May 1	Suakin (Red Sea)—Lighthouse	Ports and Lights Administration	Deputy-Controller-General, Ports and Lights Administration, Alexandria.
,, 2	Kanturk, Ireland—Waterworks	Rural District Council	T. Guiney, Clerk, Workhouse, Kanturk.
,, 8	Bishop's Stortford—Boilers, &c.	Urban District Council	T. Swatheridge, 7 North Street, Bishop's Stortford.
,, 30	Sydney, New South Wales—Refuse Destructor	Municipal Council	Acting Agent-General for State of New South Wales, Victoria St., S.W
No date	Harley, Surrey—Excavating, &c.	District Gas Co.	Engineer, Gas Offices, Station Road, Harley.
	IRON AND STEEL:		
April 14	Christiania—Steel Plates	Commercial Intelligence Branch of Board of Trade.	Commercial Intelligence Branch of Board of Trade, 73 Basinghall Street, E.C.
,, 14	Brownhills, Staffs—Ironwork, &c.	Urban District Council	W. B. Chancellor, Public Buildings, Brownhills.
,, 15	Prestwich—Iron Manhole Covers, &c.	Urban District Council	W. Nuttall, Chester Bank, Prestwich.
,, 15	Glasgow—Pipes	Corporation	J. R. Sutherland, 45 John Street, Glasgow.
,, 16	Pontypridd—Ironmongery	Urban District Council	P. R. A. Willoughby, Surveyor to Council, Pontypridd.
,, 17	Bristol—Iron Castings	Bristol Docks	W. W. Squire, Dock's Engineer, Cumberland Basin, Bristol.
,, 17	Wigan—Wrought-iron Tube, &c.	Gas Committee	J. Timmins, Gasworks, Wigan.
,, 18	Castlecomer, Ireland—Cistern	Guardians	Workhouse, Castlecomer.
,, 19	Dublin—Steel Files, &c.	Dublin, Wicklow and Wexford Railway Co.	M. F. Keogh, Westland Row, Dublin.
,, 20	Egremont, Cheshire—Wrought-iron Tube	Wallasey U.D.C.	Gas and Water Engineer's Office, Dock Road, Seacombe.
,, 31	Manchester—Pipes	Waterworks Committee	Secretary, Waterworks Office, Town Hall, Manchester.
Sept. 1	Sydney, Australia—Iron and Steel	——	Agent-General's Office, 9 Victoria Street, S.W.
	PAINTING AND PLUMBING:		
April 13	Doncaster—Painting and Decorating Chapel	Trustees	Councillor Theobald, Red House, Doncaster.
,, 13	London, S.E.—Painting Interior & Exterior of Workhouse	Guardians	E. P. Fenton, 283 Tooley Street, S.E.
,, 13	Halifax—Painting Interior of Town Hall	Finance Committee	J. Lord, Town Hall, Halifax.
,, 13	Ystrad Rhondda—Painting Two Pavilions	Urban District Council	W. J. Jones, Public Offices, Pentre, Rhondda.
,, 14	Abercynon, Wales—Internal Painting at Police-station	Standing Joint Committee	County Offices, Westgate Street, Cardiff.
,, 14	Whitby—Painting, &c., Sitting-room and Bathroom	Guardians	Workhouse, Whitby.
,, 15	Prestwich—Paints, &c.	Urban District Council	W. Nuttall, Chester Bank, Prestwich.
,, 17	Leeds—Painting at Parks, &c.	——	City Engineer's Office, Leeds.
,, 17	Stafford—Painting at Cottages	Corporation	W. Blackshaw, Borough Hall, Stafford.
,, 17	Bristol—Oils and Lead	Bristol Docks	W. W. Squire, Docks Engineer, Cumberland Basin, Bristol.
,, 19	Dublin—Oils and Paints	Dublin, Wicklow and Wexford Railway Co.	M. F. Keogh, Westland Row, Dublin.
,, 20	Egremont, Cheshire—Oils and Paints	Wallasey U.D.C.	Water and Gas Engineer's Office, Dock Road, Seacombe.
	ROADS AND CARTAGE:		
April 13	Helmsley, Yorks—Stone	Rural District Council	R. Pearson, Clerk, Helmsley.
,, 13	Cardiff—Paving, Kerbing, &c.	Corporation	W. Harpur, Borough Engineer, Cardiff.
,, 13	London, N.W.—Wood Paving	Hampstead Borough Council	O. E. Winter, Town Hall, Haverstock Hill.
,, 14	Brownhills, Staffs—Macadam Stone, &c.	Urban District Council	W. B. Chancellor, Public Buildings, Brownhill.
,, 14	Sunbury-on-Thames—Making-up Road	Urban District Council	H. F. Coales, Council Offices, Sunbury.
,, 15	Prestwich—Road Materials	Urban District Council	W. Nuttall, Chester Bank, Prestwich.
,, 15	Tenterden, Kent—Road Materials	Corporation	W. L. C. Turner, Town Hall, Tenterden.

Complete List of Contracts Open.—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		ROADS AND CARTAGE—*cont.*		
April	15	Bradford—Road Metal	Corporation	J. H. Cox, Town Hall, Bradford.
,,	15	Hoyland, near Barnsley—Road Materials	Urban District Council	H. G. Reywood, Town Hall, Hoyland, near Barnsley.
,,	15	Ramsbottom, Lancs—Construction of Street	Urban District Council	T. H. Bell, Council Offices, Ramsbottom.
,,	15	Southborough, Kent—Road Materials	Urban District Council	P. Hanmer, Council Offices, Southborough.
,,	15	Sutton Bridge, Lincs—Road Materials	Urban District Council	Surveyor, Oddfellows Hall, Sutton Bridge.
,,	16	Pontypridd—Stone Setts, &c,	Urban District Council	P. R. A. Willoughby, Council Offices, Pontypridd.
,,	17	Sudbury, near Uttoxeter—Road Materials	Rural District Council	F. S. Hawthorn, Clerk, Uttoxeter.
,,	17	Bristol—Broken Stone, &c.	Bristol Docks	W. W. Squire, Docks Engineer, Cumberland Basin, Bristol.
,,	20	Oakham—Road Materials	Rutland C.C.	B. A. Adam, Clerk, Oakham.
,,	20	Houghton-le-Spring, Durham—Road Materials	Rural District Council	D. Balfour, Houghton-le-Spring.
		SANITARY:		
April	14	Cleethorpes, Lincs—Sewer, &c.	Urban District Council	E. Rushton, Council House, Cleethorpes.
,,	14	Leeds—Set of Conveniences	Corporation	City Engineer's Office, Leeds.
,,	15	Ramsbottom, Lancs—Sewers, &c.	Urban District Council	J. Diggle & Sons, 14 Victoria Street, S.W.
,,	15	Prestwich—Disinfectants	Urban District Council	W. Nuttall, Chester Bank, Prestwich.
,,	16	Pontypridd—House-drainage Connection	Urban District Council	P. R. A. Willoughby, Surveyor to Council, Pontypridd.
,,	17	Smethwick—Sewerage Works	Corporation	C. J. Fox Allin, Town Hall, Smethwick.
,,	18	Kenilworth—Sewerage, &c., Works	Urban District Council	Willcox & Raikes, 63 Temple Row, Birmingham.
,,	25	Epsom—Extension of Sewer	Rural District Council	Council Offices, Waterloo Road, Epsom.
		TIMBER:		
April	17	Bristol—Timber	Bristol Docks	W. W. Squire, Docks Engineer, Cumberland Basin, Bristol.
,,	19	Dublin—Native and Foreign Timber	Dublin, Wicklow and Wexford Railway Co.	M. F. Keogh, Westland Row, Dublin.
,,	24	Dublin—Sleeper Blocks	Great Northern Railway Co.	T. Morrison, Amiens Street Terminus, Dublin.

List of Competitions Open.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
April	14	Swindon—School	£5 per cent.	—	W. Seaton, Education Office, Town Hall, Swindon.
,,	15	Letchworth—Cottages	£50	—	W. V. Cooper, 347 Birkbeck Bank Chambers, Holborn, W.C.
,,	17	Cardiff—Libraries	£75 & £50	—	Chief Librarian, Central Libraries, Cardiff.
,,	29	Radcliffe, Lancs—Library, &c.	£50, £30 & £20	£1 1s.	S. Mills, Council Offices, Radcliffe, Manchester.
May	1	Ilford—Design for Adhesive Stamp for Hospital Committee.	—	£2 2s.	Wright & Sons, 31 Cranbrook Road, Ilford.
,,	15	Rochester—Institute	£50, £21 & £10 10s.	—	W. Banks, City Surveyor, Rochester.
,,	24	Harrogate—Orphanage	—	10s.	Rev. J. T. Barkley, Riche Mont, Harrogate.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

Tenders.

Bradford.—For the extension of the town hall:—

Excavator, concretor, mason and bricklayer.	
Michael Booth & Sons, Clayton	£8,750
Iron and steelwork.	
S. Parsons & Co., Ltd., Horton	649
Heating and ventilating.	
J. H. Jeffrey	1,569

[Recommended for acceptance.]

Cork.—Accepted for the erection of semi-detached villas and terraces of houses, also for fencing, sewering, &c., for Mr. Thomas Donovan. Messrs. W. H. Hill & Son, architects, 28, South Mall, Cork:—

P. Murphy, John Street, Cork £6,400

Cork.—For additions to and reconstruction of premises, 52, South Mall, for the Church of Ireland Incorporated Young Men's Association. Messrs. W. H. Hill & Son, architects, 28, South Mall, Cork:—

	£	s.	d.
M. Galvin	£3,761	17	10
A. Taut	3,600	0	0
D. O'Callaghan	3,575	0	0
D. Kelleper	3,450	0	0
E. B. McSweeny & Co.	3,484	0	0
S. Hill	3,350	0	0
J. Kearns	3,350	0	0
E. & P. O'Flynn,* Watercourse Road	3,160	0	0

* Accepted. [All of Cork.]

Harbury (near Leamington).—For alterations, reparations, additions and new stabling at The Hall, for Captain Frank Osborne. Special estimates for plumbing, stable fittings, flooring, &c., not included. Mr. C. M. C. Armstrong, architect, 5, High Street, Warwick:—

W. J. Bloxham, Banbury	£1,903
J. H. Cashmore, Warwick	1,899
A. Kimberley, Banbury	1,875
R. Bowen, Leamington	1,791
E. Smith & Son, Kenilworth	1,687
G. F. Smith & Sons, Leamington	1,637
J. Hollowell, Rugby	1,625
J. Parnell & Son, Rugby	1,624
F. Davis, Moseley	1,579
C. Hope,* Berkswell	1,464

* Accepted.

King's Langley.—For alterations and additions to "Serge Hill," for Mr. H. W. Henderson. Mr. Henry F. Mence, architect, Town Hall Chambers, St. Albans:—

E. Dunham	£850
Boff Brothers, Park Street	785
C. Miskin & Sons*	720

* Accepted. [All of St. Albans.]

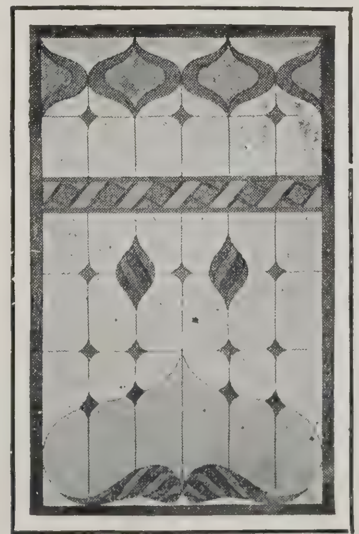
London, W.—For the erection of Shepherd's Bush Sorting Office, for H.M. Office of Works, &c.:—

				A.		
J. Haydon & Sons	£4,860	0	0	—		
Fowler & Co.	2,704	0	0	16	11	6
W. J. King	2,640	0	0	39	9	0
Mattock & Parsons	2,593	0	0	20	0	0
Snewin Brothers & Co.	2,590	0	0	259	0	0
W. Willett	£2,560	0	0	£34	0	0
Prestige & Co.	2,554	0	0	17	0	0
G. Neal	2,549	0	0	15	0	0
T. Mills & Son	2,525	0	0	10	0	0
A. Woods	2,500	0	0	18	11	0
Leslie & Co., Ltd.	2,497	0	0	16	0	0
G. Parker	2,475	0	0	8	0	0
W. J. Dickens	2,460	0	0	20	0	0
C. Ansell	2,452	0	0	69	0	0
W. Taylor & Co.	2,450	0	0	75	0	0
H. Kent	2,449	0	0	27	0	0
F. & A. Willmott	2,429	0	0	30	0	0
J. Garrett & Son	2,422	0	0	10	0	0
Speechley & Smith	2,417	0	0	26	0	0
General Builders, Ltd.	2,403	0	0	30	0	0
Chambers Brothers	2,395	0	0	—		
T. H. Kingerlee & Sons	2,369	0	0	—		
E. A. Roome & Go.	2,369	0	0	40	0	0
H. J. Williams, Ltd.	2,347	0	0	10	0	0
T. D. Leng	£2,318	0	0	£32	0	0
E. J. Clayton	2,317	0	0	17	0	0
Wilkinson Brothers	2,300	0	0	10	0	0
J. Smith & Sons, Ltd.	2,298	0	0	35	0	0
Spencer, Santo & Co., Ltd.	2,293	0	0	—		
Martin, Wells & Co., Ltd.	2,290	0	0	—		
Wisdom Brothers	2,250	0	0	50	0	0
W. Wallis	2,248	0	0	29	0	0
Banyard & Son	2,245	0	0	30	0	0
B. E. Nightingale	2,244	0	0	20	0	0
A. Hudson & Co.	2,242	0	0	11	0	0
J. Christie	2,197	0	0	19	0	0
W. J. Renshaw	2,197	0	0	25	0	0
J. Appleby & Sons	2,194	0	0	50	0	0
R. Dean & Co.	2,190	4	0	30	4	0
J. Shelbourne & Co.	2,179	0	0	5	0	0
Galbraith Brothers	2,133	0	0	33	0	0

A. Credit old materials.

(*Continued on p.* xxii.)

"CLOISONNE GLASS"



A decorative material transparent and opaque.

Production 1904—
17,000 square feet.

The CLOISONNE GLASS CO.

9E Berners St. Oxford St.
London W.

prices from 3/- per square foot

TENDERS—*cont. from p.* xxi.

Portsmouth.—For the erection of a new wing and extension of the boundary wall at the infectious diseases hospital at Milton, for the Corporation :—

Wilkins & Son, Bristol	£7,952	0	0
H. & W. Evans	7,000	0	0
J. Crockerell	7,111	0	0
Perkins & Durrant, Fratton	6,890	0	0
G. J. Davis	6,792	0	0
F. J. Privett	6,526	0	0
W. Learmouth, North End	6,460	0	0
F. Corke	6,366	0	0
S. Salter	6,337	0	0
M. Coltherup, 8, Lombard Street, Portsmouth	5,997	10	0

[Rest of Southsea.]

Radlett (Herts).—For the erection of two detached residences on the Radlett Park Estate, for Mr. Horace Slade. Mr. Henry F. Mence, architect, Town Hall Chambers, St. Albans :—

Vail & Williamson	£1,895	10	0
Goodchild & Jeffery, Radlett	1,860	0	0
Dumpleton	1,638	0	0
E. Dunham*	1,636	0	0

* Accepted. [Rest of St. Albans.]

South Shields.—Accepted for the erection of new municipal buildings on the Ogle Terrace site, for the Corporation :—

Thomas Riley, Fleetwood	£46,450	5	11

Sprowston (Norfolk).—For the erection of infants' school, for the Norfolk County Council. Mr. Charles J. Brown, architect, Cathedral Offices, The Close, Norwich :—

R. Burton	£2,620	15	9
Riches	1,750	0	0
Youngs & Son	1,693	0	0
Gill	1,690	0	0
Lincoln	1,657	0	0
Scarles Brothers	1,633	0	0
Hannent	1,625	0	0
Greengrass	1,587	0	0
Boddy & Son	1,585	0	0
Chapman & Son	1,578	0	0
G. Stowers,* 143, Sprowston Road, Norwich	1,540	0	0

* Accepted.

Tetbury (Glos).—For proposed alterations and additions to the workhouse, for the Guardians. Mr. V. A. Lawson, architect, 17, Rowcroft, Stroud :—

Forse & Sons, Bristol	£4,898	0	0
A. King & Son, Gloucester	4,887	0	0
Bowers & Co., Hereford	4,470	0	0
Estcourt, Gloucester	4,451	0	0
Saunders & Sons, Ltd., Cirencester	4,280	0	0
W. S. Jenkins, Tetbury	4,273	13	0
Draper & Wallington, Gloucester	4,157	0	0
G. Shaylor & Sons, Brimscombe	£4,150	0	0
W. Drew, Chalford	3,850	0	0
Wall & Hook, Brimscombe	3,848	0	0
A. S. Cooke, Stroud	3,790	6	0
Orchard & Peer, Stroud	3,730	0	0
A. J. Colborne, Swindon	3,708	18	0
G. Drew,* Cirencester	3,700	0	0

* Accepted.

Tiverton.—For additions to a house for the Governors of Blundell's School. Mr. W. Barrons, architect, Tiverton :—

Nicks Brothers, Bradninch	£1,950	0	0
Labdon & Sons, Cullompton	1,854	0	0
R. Grater & Sons, Tiverton	1,598	0	0
W. Loosemore, Tiverton	1,595	0	0
J. Grater & Sons,* Tiverton	1,594	10	0

* Accepted.

Tiverton.—Accepted for the erection of a house for Mr. E. F. Clarke. Mr. W. Barrons, architect, Tiverton :—

J. Grater & Sons, Tiverton	£1,021

Wheatley Hill (Durham).—For the erection of new club premises and caretaker's house, for the Wheatley Hill Workmen's Social Club and Institute, Ltd. Mr. H. T. Gradon, architect, 22, Market Place, Durham :—

Fountain & Milward	£2,185	0	0
Walker Brothers, Castleford	2,185	0	0
E. M. Twaddle	2,120	0	0
J. Browell, Blaydon-on-Tyne	2,020	0	0
Draper & Sons, Leamside	1,970	0	0
G. Booth	1,961	9	11
G. T. Manners, Durham	1,948	0	0
R. M. Storey, West Boldon	1,915	0	0
Braithwaite & Co., Newcastle-on-Tyne	1,906	5	0
Watt Brothers	1,874	6	0
H. C. Howe	1,770	0	0
J. W. Hope	1,750	0	0
J. G. Bradley, Durham	1,732	0	0
W. H. Ayton,* Heaton	1,706	3	0

* Accepted. [Rest of West Hartlepool.]

Wimbledon.—Accepted for the erection and completion of a residence in Parkside Avenue, for Mr. A. W. Gower. Mr. E. C. Homer, architect, 35, Bucklersbury, E.C. :—

C. Gimson	£3,700	0	0

Stables and coach-houses.

W. R. Williams	983	0	0
Larke & Sons	890	0	0
Castle & Sons	880	7	0
A. Hudson	778	9	0
C. Gimson*	680	0	0

* Recommended for acceptance.

Youghal (Ireland).—Accepted for additions and improvements to the Provincial Bank. Messrs. W. H. Hill & Son, architects, Cork :—

D. Creedon, Fermoy, co. Cork	£1,437	10	0

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending April 7th twenty-five failures in the building and timber trades in England and Wales were gazetted.

A. FIDO, builder, Bristol. Adj. March 29th.

W. HUGGINS, builder, Leyton. R.O. March 31st.

F. BARTON, plumber, glazier and gasfitter, Sheffield. R.O. March 29th.

E. HITCHCOCK, stonemason, Gipsy Hill. Adj. March 28th.

J. BROOKS, monumental mason, Smethwick and Witton, Staffs. R.O. March 30th.

F. WATKIN, timber merchant, Northampton. R.O. March 28th.

F. E. CULLIMORE, builder and contractor, Ashford. R.O. March 30th.

T. WHITNEY, builder and contractor, Manchester. R.O. March 27th.

W. MORTON, mason and contractor, Hale. R.O. March 28th. First meeting, O.R.'s, Manchester, April 12th, at 2.30. P.E., Manchester C.C., April 17th, at 10.

W. E. WILKINS, carpenter and builder, Bristol. R.O. March 29th. First meeting, O.R.'s, Bristol, April 12th, at 12. P.E., Bristol Guildhall, May 5th, at 12.

H. ALDRIDGE, builder and contractor, Catford and Lewisham. R.O. March 14th. P.E., Greenwich C.C., April 18th, at 1.

S. KENT, builder, Acocks Green. First meeting, 191, Corporation Street, Birmingham, April 14th, at 11. P.E., Birmingham C.C., May 17th, at 2.

ROBINSON & EDWARDS, builders, Seaton Sluice. R.O. March 29th. First meeting, O.R.'s, Newcastle-on-Tyne, April 12th, at 12. P.E., Newcastle C.C., April 27th, at 11.

W. BELCHER, brick merchant, Paddington. R.O. March 28th. P.E., London Bankruptcy Court, May 10th, at 11.

W. BLACKBURN, plasterer, York. R.O. March 30th. First meeting, O.R.'s, York, April 14th, at 2.30. P.E., York Courts of Justice, May 5th, at 11.

W. J. TREVENA, master plasterer, Stokesley. P.E., Stockton-on-Tees C.C., April 19th, at 11. First meeting, O.R.'s, Middlesbrough, same day, at 3.

F. J. NEWMAN, glass merchant, Croydon. R.O. March 27th. First meeting, 24, Railway Approach, London Bridge, April 13th, at 11.30. P.E., Croydon C.C., May 17th, at 11.

New Companies.

CAUCASUS ASPHALT CO., LTD. Capital: £20,000.

SUTTON AND CHEAM BRICK AND TILE WORKS, LTD., 521, Salisbury House, E.C. Capital: £12,000.

G. B. KENT & SONS'

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LONDON, E.C.
ESTABLISHED 128 YEARS.

MONTHLY

FIRE SUPPLEMENT

TO THE

BUILDERS' JOURNAL AND ARCHITECTURAL RECORD.

Edwin O. Sachs, F.R.S.Ed., Architect,
Consulting Editor.

Number 6.
April, 1905.

LONDON BUILDING ACTS AMENDMENT BILL.

Provisions in the Bill for reducing Risk of Fire in Buildings other than Part VIII.

By a Fire Risk Surveyor of Forty Years' Experience.

THE London County Council have, in consequence of powerful opposition, withdrawn the whole of their London Building Acts Amendment Bill with the exception of Part VIII., which is headed "Means of escape in case of fire and provisions for reducing risk of fire in buildings."

It would only be reasonable to infer that all provisions proposed with the objects named in the above heading are contained in this part of the Bill, but unfortunately such is not the case.

It is important, therefore, that the Parliamentary Committee to whom the remaining part of the Bill may be referred should exercise their powers (subject to such modifications and correction as they may find to be desirable) to recommend the adoption of sections included in other parts of the Bill having only similar objects in view.

"Provisions for reducing risk of fire in buildings" by which life may be endangered or lost are on the principle that prevention is better than cure, equally if not more important than the provision only of "Means of escape in case of fire."

The following are the principal sections referred to, each (with the exception of section 77) being necessary "for reducing risk of fire in buildings" to which very little, if any, opposition has been offered:—

Part VI.—Construction of Buildings.

Section 60.—Rules as to the extent of recesses and openings in walls to be applied separately to the wall of each storey and not as at present to the whole of a wall.

This is necessary to secure greater stability under the action of fire and to lessen somewhat the risk of fire spreading from a burning building to others.

Section 63.—Parapets required to the walls of all new buildings abutting immediately on a public way.

This is needed to assist in the rescue of persons who may use the escapes to roof which are to be provided.

Section 65.—Requires stoves and chimney-pieces in chimney openings to be solidly set with brickwork or concrete composed of ballast or broken brick so as to avoid all cavities in which soot can accumulate.

The ignition of accumulations of soot in cavities at the back of improperly set stoves and boxed chimney-pieces frequently communicates fire to skirtings and other woodwork near, at times with fatal consequences, as was the case at Ashmount Road, Islington, on 30th December, 1903.

Section 66 requires a more secure arrangement for flues from any new oven-furnace cockle steam boiler, or close fire used for any purpose of trade or business, or for the range or cooking apparatus of any hotel tavern or heating-house.

Improperly constructed flues, especially where used for heating appliances of the nature described, are a frequent cause of fires, at times resulting in loss of life.

Section 66 (4).—Flues not to be nearer than 2ins. to the centre line of any party-wall.

The arrangement of flues in the manner forbidden by above rule is a constant source of alarm in London houses, and is the cause of many fires. It frequently happens that the strings of wooden stairs of one house pass 4½ins. only from the inside of the flues of an adjoining house. Many fires have been traced to this defective arrangement, and many others, that destroyed all evidence of their origin, have doubtless originated from such defects, occasionally with fatal consequences.

Section 66 (7).—No iron or steel joists or ironwork to be placed in any flue except as may be required by the provision of existing Act for ensuring stability.

It is important that metal in contact with woodwork should not be liable to be raised to a high temperature at any point, because conduction of heat through the metal to the wood may set up dangerous conditions.

Section 69.—Roofs over oven or furnace-rooms to be of iron or steel and concrete.

This rule already applies to floors, and its application to roofs is obviously necessary.

Section 71 (c).—Habitable rooms over stables, with their approaches, to be separated from the stables by solid concrete floors and 4½in. brick walls.

This arrangement would provide means of escape in case of fire, as well as improved sanitary condition.

Section 77.—Floors constructed throughout to the satisfaction of the Council to be allowed as separations for the calculation of cubic contents.

Warehouses built in accordance with this section, unless the capacity of each storey is limited to, say, 60,000 cub. ft., would be very dangerous in the event of fire. A top storey having a capacity of 250,000 cub. ft., covered with a timber slated and glazed roof and filled with combustible goods as this section allows, would seriously endanger acres of surrounding buildings, and two or more such structures in proximity might cause widespread destruction should a fire gain a hold during a high wind. The fire-resisting protection for constructional ironwork or steelwork, as provided by section 87, would not be sufficient to avoid collapse in the case of fire in a storey of the extent named heavily stocked with combustible goods. Window openings would also form exposures between the storeys of such buildings. The limitation of the extent of warehouse buildings has been the salvation of London with regard to sweeping conflagrations. Any further concessions on the Act of 1894 in this direction would be sure sooner or later to be followed by alarming disasters, similar to that experienced at Baltimore in 1904.

Section 78 formulates improved rules for fire-resisting doors.

Experience shows that this is necessary, but it is doubtful if the rules proposed are sufficient. Iron frames for fire-resisting doors should be bolted together through the wall, and the door when closed secured to the frames by cleats and bolts not more than 3ft. apart. Sight holes in the doors, closed with a flap, are very useful for examination and discharge of hose streams without opening the door. Stone should not be used for the jambs and beads of openings fitted with fire-resisting doors, as now allowed.

Section 81.—Doors of churches and all places of public assembly to have automatic bolts allowing the doors to open outwards on pressure.

This is a very necessary provision to afford means of escape in case of fire or panic.

Section 83.—A building previously used as one shop not to be used as two or more shops unless separated by party structures of fire-resisting materials.

No objection can be reasonably taken to this provision.

Section 84 (1).—Openings not to be made in walls being in part external and in part party-walls (without the consent of the Council) within 10ft. of any portion of the wall used as a party-wall or of any portion of a building adjoining any part of such party-wall.

In addition it is desirable that all such openings should have fire-resisting windows or doors.

Section 84 (2).—No opening without the consent of the Council to be made in any external wall of any building within 30ft. of any opposing opening in any other building.

This is a very sweeping provision. It is concluded that such openings would be allowed if protected with fire-resisting window-frames and glazing.

Section 87 requires all constructional ironwork in any new building to be encased in concrete, brickwork, terra-cotta or metal lathing plaster or cement not less than 2ins. in thickness, with the object of protecting the same from the effect of fire.

The Council already have powers under section 164 of the London Building Act, 1894, to make by-laws for the protection of ironwork used in the construction of buildings from the action of fire. This is of great importance, as is shown by the results of fires in modern buildings.

Section 89 provides for the making of regulations with respect to buildings of iron and steel skeleton construction.

This is of growing importance, and should be extended to include structures of reinforced concrete.

Part VII.—Special and Temporary Buildings and Wooden Structures.

Section 92.—Buildings on railway company's premises not to be exempt from the provisions of the Act unless used exclusively for the purposes of the railway.

This is reasonable and necessary.

Section 93.—Regulations as to wooden structures licensed by local authorities.

To this might with great advantage be added regulations for better control over temporary timber and canvas structures for bazaars, ballrooms and similar purposes.

Section 94 provides for powers to require the removal of certain wooden structures within two years from date of notice.

Part VIII.—Means of escape in case of fire and provisions for reducing risk of fire in buildings.

This part of the Bill embraces sections 95 to 109, which remain for the consideration of Parliament. The provisions in section 106 of this part of the Bill, requiring openings in the external walls of all new buildings of the warehouse class opposing and within 30ft. of openings in the external wall of any other building to be protected with fire-resisting frames and glazing or fire-resisting doors or shutters, will not be alone sufficient to effect the object in view. To secure this it will also be necessary to protect the roofs of such buildings. The usual timber roof covered with slates or zinc offers very little resistance to the spread of fire; roofs of this character should be forbidden in districts crowded with warehouses and workrooms.

Part XVI.—Miscellaneous.

Section 150.—Regulations for the storage of wood, timber, casks or barrels.

Section 157.—Posts or bars across courts or passages to be hinged, and two keys of any locks deposited at the nearest fire station.

Section 164.—Exempted buildings on cesser of exemption to be made to conform to Act.

Section 166 (1).—Buildings destroyed for more than one-half their cubical extent to have remaining old portion made to conform to the provisions of Act.

Section 166 (2).—Any addition to an existing building to the extent of one-half the cubical extent of the existing building not allowed unless the whole of existing building made to conform to the Act.

Serious objection cannot be made to the foregoing reasonable provisions in Part XVI.

Other Amendments.

The following further amendments to the Act of 1894, with modifications and additions to the Amendment Bill, 1905, are desirable:—

Act 1894, *section* 5 (28).—Fuller definition of the term "warehouse" required. Many buildings under 150,000 cub. ft. exist, used for purposes which seriously endanger adjoining properties that are not treated as "buildings of the warehouse class."

Act 1894, *section* 64.—It is desirable to require that disused fireplaces and flues in buildings of the warehouse class be protected against the danger of sparks from neighbouring chimneys or fires falling down a flue and igniting accumulations in boarded-up fireplaces. Many fires can be traced to this cause, including the serious fire in Falcon Street on 13th August, 1902.

Act 1894, *section* 64 (22).—Wooden plugs driven as near as 6ins. and iron holdfasts as near as 2ins. to the inside of a flue, as sanctioned by this section, have been the cause of many fires. The fixing of skirtings or other woodwork on the face of brickwork only 4½ins. thick enclosing a flue, even if the brickwork is rendered as provided in the section 64 (21), 1894 Act, is dangerous and is not necessary, as any finishings in such positions can be readily formed in cement or plaster.

Act 1894, *section* 64 (15), (16), (17).—Slate should not be allowed for hearths, and the words "non-conducting" should be added after the word incombustible. Iron hearths in contact with wood floors are dangerous.

Act 1894, *section* 66 (1).—Hearths of an incombustible and non-conducting character should be required for gas stoves, especially gas cooking-stoves; the absence of this has resulted in numerous fires.

First Schedule, Bill 1905.

(i) *For General Purposes.*—(2) Granite and other stone, although solid and durable, are not fire-resisting. (4) Slate is not a fire-resisting material, and its use for coverings or corbels is dangerous when exposed to fire. (6) Coke-breeze varies so widely as to make it undesirable to sanction its use for fire-resisting concrete. Stone is also a bad material to use for this purpose.

(ii) *For Special Purposes.*—(4*b*) Wood joists used for pugged floors need to be protected with plaster, as in (2), (3) and (6) of this part of same schedule.

L.C.C.'s Own Exemption.

By section 159 (18) of the Bill, 1905, the Council seek exemption from the whole of their own regulations.

PROVINCIAL & DISTRICT FIRE STATIONS.

By **ARTHUR PORDAGE**, Firemaster of Edinburgh.

THERE has never at any previous time been so much attention devoted by our municipal authorities to the matter of fire-brigade equipment as the present. The authorities are recognizing the essential needs of fire-prevention and protection as being important factors in the well-being of both industrial and residential centres, the necessity for which has perhaps been forced home more prominently during the past few years by large gaps made in business centres by disastrous fires which have discovered many large English provincial towns without a fire department worthy of the name.

The necessity for an efficient equipment is however becoming more generally apparent, and the constant erection of fire stations in the country affords an opportunity of studying the plans reproduced in the journals and to note the diversified views of architects and others responsible for the buildings. In reviewing those plans there are many points which strike one as having either been overlooked altogether or which appear to have been carried out with a certain degree of imperfect information upon what may appear to be details of small moment, but which, though small, are details of considerable importance in working the station.

In dealing with plans of fire stations no general rule can of course be laid down, as the piece of ground allotted to the purpose is often of very unequal dimensions; but where a general rule is impossible a general principle is imperative, the main factors being the engine-room with stables and the general approaches thereto for the men, all of which should be of such a combination as to ensure rapid concentration and efficient "turn-out."

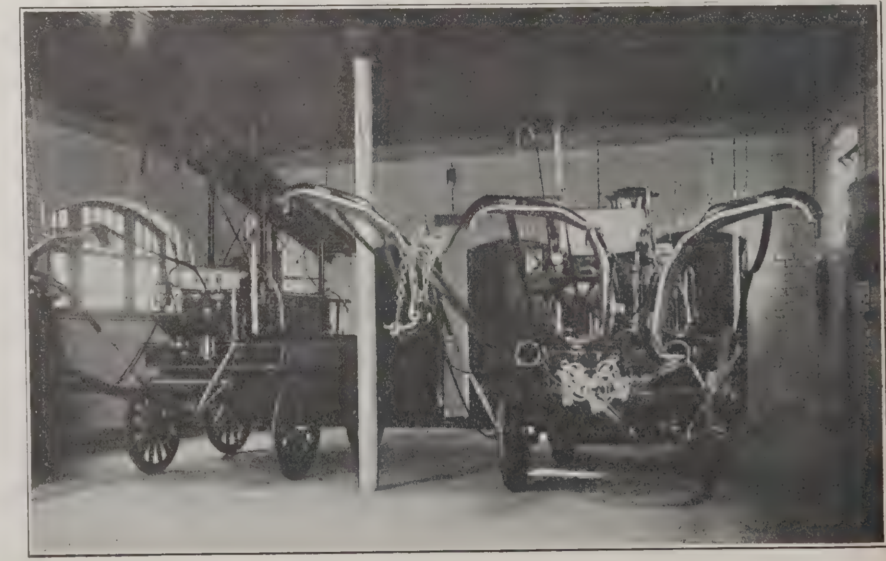
It will, I think, be admitted that an up-to-date station should have the stables in the immediate rear of the engines, with the door of each stall opening into the engine-room, in order that each horse may be trained to run up to its allotted position at the engine. One point to be considered here is that the distance between the hind part of the engine and the stall door should be as short as possible, so as to offer little inducement to the horse to go astray. The older method of placing the stables on the opposite side of a courtyard should, I think, not be taken into consideration at this period, although I am surprised to find a large station recently built in the provinces at a cost of £7,000 has such an arrangement with a space of 50ft. between the front of the stables and the rear doors of the engine-room.

The stables built immediately to the rear of the engine-room need not necessarily form part of the main structure; it is, in fact, more convenient as an attached building with flat roof, the latter affording excellent roof-drilling facilities.

A roomy stable is also a point to be aimed at. A stall 6ft. 6ins. wide by 11ft. deep, and with 8ft. passage behind, gives a good airy stable, allowing comfortable room for the horses to turn and plenty of breathing space for the coachmen to dress their horses behind the stalls in wet weather.

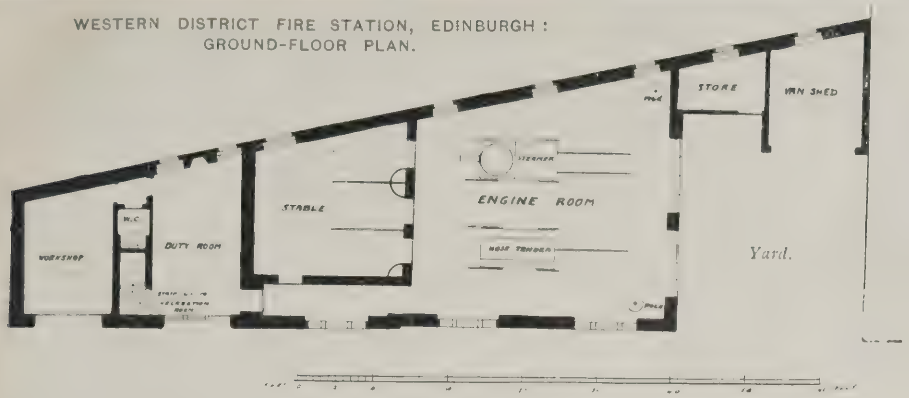
The absence of the provision of an independent or domestic entrance in most fire-stations for the families of the staff, and the consequent stream of women, children and message boys with their bundles and baskets through the engine-room, station or yard, should be avoided. The service portion of a fire station should be restricted absolutely to the service requirements; there is no justification whatever for the wives and families being either in or near the engine-room, yard or workshops portion of a fire station at any time. This is a point which is apparently seldom considered, but is one which should receive due consideration. None but the men are required in the engine-room or its approaches during a "turn-out."

The watch-room or duty-room should constitute the business entrance of the station, and have access direct from the street, and should have such a front elevation as to offer no possible doubt as to its identity as the entrance to which a complete stranger would go to give an alarm of fire. The forming of the duty-room entrance from a



WESTERN DISTRICT FIRE STATION ANGLE PARK, EDINBURGH.

WESTERN DISTRICT FIRE STATION, EDINBURGH: GROUND-FLOOR PLAN.



large opening similar to the engine-house exits for the engines is confusing to the stranger, as is also the practice of utilizing one of the engine-house gates as the general entrance. The position of the duty-room should be such that the fireman on duty has a view of the operations during a "turn-out," and the position of the switchboard be such that while attending to the telephones and fire alarms he may also operate the necessary switches, lighting or otherwise; for this purpose it is desirable that all the operating switches, &c., should be on the one board.

The men's access to the engine-room, if on the ground level should be preferably at a near corner, to allow them to follow up and not rush across in front of the horses as they run up to the harness. If poles are used by the men to reach the engine-room direct from their quarters, they should land the men in the rear of the engines clear of the run of the horses so as to avoid all possibility of baulking them.

In large stations, where provision is made for locating the "first-turn-out men" on the first floor over the engines, the poles are generally in front and the men are down in time to receive the horses, which is the most expeditious method; but as I am dealing exclusively with small provincial and district stations, where there is much less likelihood of there being sufficient men to take watch about for the first turn-out, my remarks do not apply to the latter system.

A very convenient arrangement is to provide for a hall as a general rendezvous for the men "turning out" adjoining the rear of the engine-room, to which all the approaches should lead, including the poles from the quarters. In this hall should also be hung the helmets and fire uniform.

The Paris system of stabling, where the horses stand in open stalls in the engine-room, may find favour in some quarters. I have seen most of the Paris stations, and have particularly looked for any advantage in their system during a "turn-out," but have failed to see any improvement on the closed-in stables. On the alarm given, the horses wait in the stalls until led up to the engine by the *pompiers*. It would be difficult to train the horse to run out of an open stall, because there is no change in its surroundings when the alarm is given, whereas with a closed-in stall the horse can be trained to run out when the door in front of the stall is opened. From a sanitary point of view the Paris system has nothing to commend it; the smell of the stable pervades everywhere.

An important feature in a fire station should be the heating and hot-water installation; a liberal supply of baths is essential, and each married fireman requires a bath in his private quarters, with a liberal supply of hot water. His work is often of such a dirty and disagreeable nature that a bath before he can go to his bed after attending a fire is in many instances a necessity. A commodious hot closet for drying fire uniforms is also indispensable. In connection with the boiler for providing the above the steamer may be heated and the usual gas-burner be dispensed with. An automatic connection may be attached to the steamer to receive either a continuous supply of hot water or steam, by which means the boiler of the steamer is heated from the ordinary heating arrangements of the station, obviating the expense of gas heating.

The foregoing remarks apply more particularly to fire stations in the smaller provincial towns, where the equipment of the only station should of necessity be on a most efficient footing.

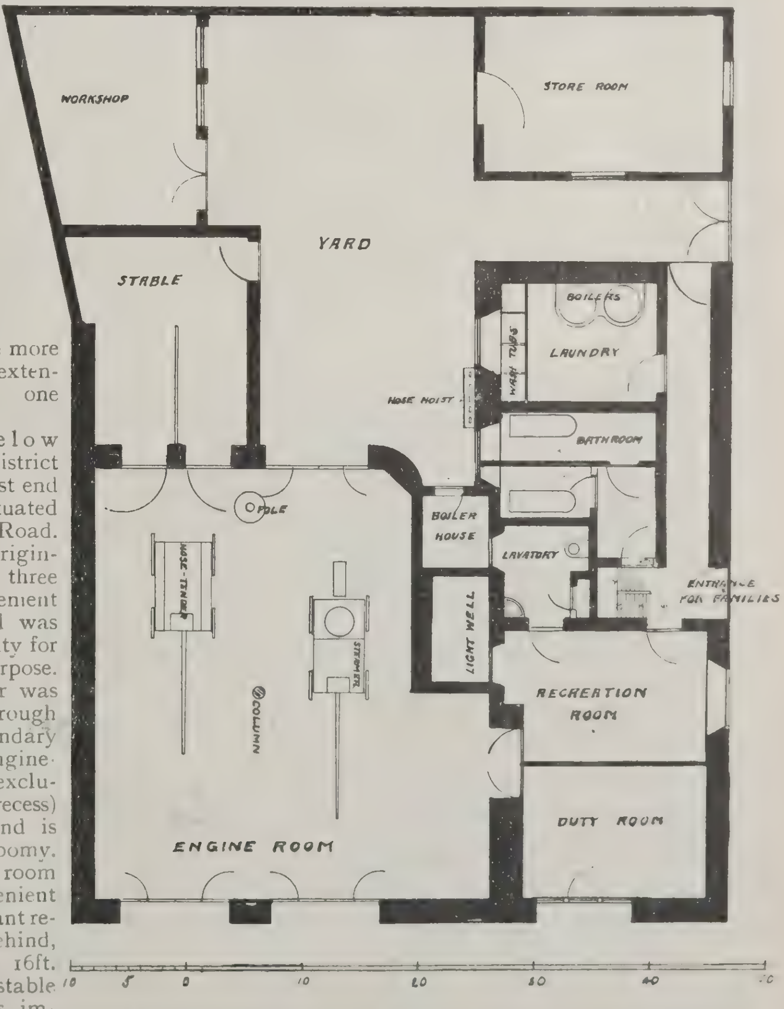
District Stations.

In dealing with district stations in large cities where there is an efficient headquarters the protection of the district is met by the efficient housing of a steamer and tender or horsed fire-escape tender, consequently the establishment of the station does not necessarily require to be on an elaborate scale. A frontage of 45ft. with a depth of 70ft. will allow for a very compact district station accommodating two machines, providing a telephone room on the street front, with stables, workshop, store-room and yard in the rear. This accommodation may appear meagre, but if it supplies the turn-out of an efficient fire apparatus it meets the requirements. It is preferable to have two such stations in different districts of a city than to have only one more elaborate and extensive station in one district only.

The plan below shows the district station in the east end of Edinburgh, situated in the London Road. This property originally consisted of three shops with tenement flats above, and was bought by the city for its present purpose. The ground floor was gutted right through to the back boundary wall. The engine-room measures (exclusive of corner recess) 28ft. by 35ft., and is ample and roomy. The telephone room is of a very convenient size, with a pleasant recreation-room behind, each measuring 16ft. by 11ft. The stable for two horses is immediately behind the hose tender; a small workshop and store are also provided off a small but convenient yard. The equipment of the station is complete and up-to-date, the harness is suspended over each machine, the steamer is connected by automatic fittings and heated by hot-water circulation from a stationary boiler. The station is manned by an officer and eight men, who live in the tenement above, and a pole lands them in the rear of the engine-room. The houses are fitted with electric turn-out lights, the stable and pole-well doors are controlled by electric switches from the telephone room, the horses run up to the tender but are led up to the steamer, and a very efficient turn-out with either tender or steamer is made in 20 and 40 seconds respectively.

The other plan on this page is another of the Edinburgh fire brigade stations, and occupies a somewhat awkwardly shaped piece of ground, with a depth of only 35ft. at its widest part, narrowing down to 16ft., the side wall running along the street front and the engine-house doorways opening on to an unenclosed yard. The telephone room is in the rear of the stables. This station, like that shown on the other plan, is thoroughly complete in its appointments, the arrangements being identical. The steamer, a large one, is horsed by three horses, and is turned out in 50 seconds. The officer and eight men who man this station are housed in a tenement adjoining, and reach the engine-house by the poles shown on plan. A photograph of the interior of this station is published on the preceding page. These illustrations tend to show that though small a station need not necessarily be inefficient.

Bradford's new Fire Station is exceedingly well planned, and equipped with the most modern of American telegraphic appliances.



EAST END DISTRICT FIRE STATION, LONDON ROAD, EDINBURGH: GROUND-FLOOR PLAN.

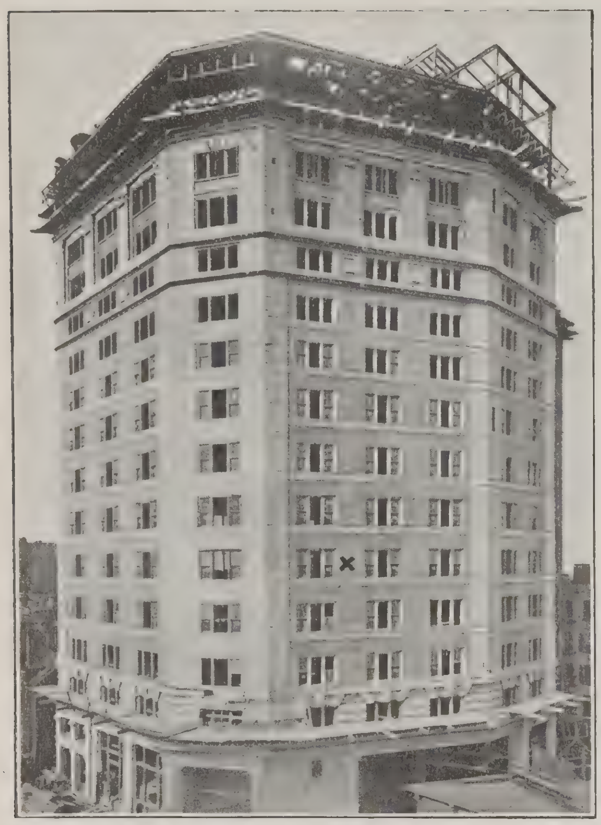


FIG. 1.—BUTTERICK BUILDING, NEW YORK: THE X SHOWS THE STOREY WHERE THE TEST WAS MADE.

FIRE TESTS IN ACTUAL BUILDINGS.

WE give below particulars of an interesting test of the fire-resisting construction employed in a building, while still in course of erection, performed by the Department of Mechanical Engineering of Columbian University at the end of last year. The method of performing this test is very instructive, for apart from the results obtained, which merely confirm facts elicited in this country from actual fires and tests, this experiment shows the possibility of investigating the value of work in course of construction. The following is taken from the report on this test at the Butterick Building, New York City, by Prof. Ira H. Woolson, of Columbia University:—

The Object of this Test was to determine the relative merits of a special cinder-concrete slab and a special cinder-concrete plaster as a fire protective covering for the bottom flange of girder **I**-beams.

In order that the two materials might be subjected to exactly the same conditions, a space 4ft. long on the bottom of a girder was plastered with the concrete mixture to be tested; adjoining this came the slab coverings, and the test chamber was arranged to include both.

The test was also designed to determine the fire-resisting properties of the cinder-concrete floor construction employed in the building. This concrete was reinforced with expanded metal. Complete data regarding the composition, age and thickness of the various concretes is given in the descriptions of the photographs and drawings following.

Location and Method of Test.

The test was conducted upon the fifth floor of the large fifteen-storey manufacturing building being erected for the Butterick Publishing Co., under the direction of Messrs. Horgan & Slattery, architects. The general view on this page shows the condition of the building at the time the test was made. The steel framework was practically all erected, the side walls were nearly finished and most of the concrete floors were laid.

A test chamber 6ft. by 8ft. internal dimensions was built in the middle of the fifth floor, the walls extending from floor to the ceiling, and so located that the girder **I**-beams to be tested ran through the middle of the portion of the ceiling enclosed by the walls. The photographic view below shows the chamber previous to the test. Three feet from the floor a suitable grate was constructed, which supported the fuel; below the grate in each wall were large draft openings. Doors for firing were also provided. In the four corners of the ceiling holes were broken through to the floor above to serve as vents, and chimney flues were constructed around these holes projecting about 4ft. to 5ft. up into the space of the sixth floor. Full details of the construction of this chamber are given in the accompanying drawings (Figs. 6, 7 and 8). Owing to a strike of the bricklayers, it was necessary to make the upper portion of the side walls of cinder concrete, but this in no way affected the results of the test.

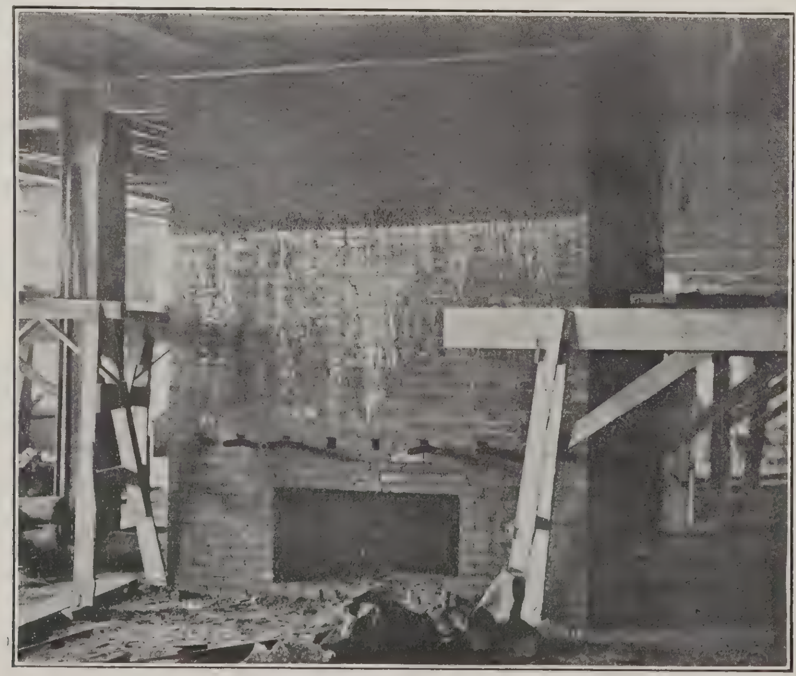


FIG. 2.—TEST CHAMBER ON THE FIFTH FLOOR.

The fuel used was cordwood and refuse wood collected about the building. Much of it was wet and unsuited for a free burning fire. The defective fuel, and a faulty arrangement of the firing floor due to the strike trouble, made it impossible to raise the heat as rapidly as desired or maintain it evenly. However, during the last twenty-five minutes of the test the heat was high and the general average sufficient to make a severe test of the beam covering.

The temperatures were determined by means of a Le Chatelier pyrometer, readings being taken every five minutes at two points located about 20ins. from the ceiling and the same distance from the side walls. Temperatures were also read between the two **I**-beams (which composed the main girder) at a point level with their bottom flanges (see Fig. 6). The attached "Table of Temperatures" gives a complete record of all readings, together with the averages.

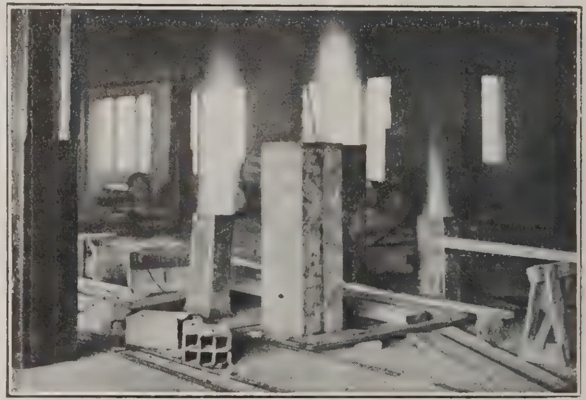


FIG. 3.—FLUES ON SIXTH FLOOR: TWO OF CONDUIT TILES USED FOR FLUES BROKEN AND REPLACED WITH METAL COLUMN BASES.

The fire was continued for 2$\frac{1}{4}$ hours, and the water was applied for five minutes to the red hot ceiling and beam covering by a detachment of firemen. The water was delivered under a pressure of 60 lbs. per sq. in. through regulation hose fitted with 1$\frac{1}{8}$in. nozzle.

Results of the Test.

During the test measurements were made to determine the amount of deflection which took place in the girder, and this was found to be less than $\frac{1}{4}$in. That the girder was not subjected to any damaging heat was evidenced by the fact that the maximum temperatures recorded on its bottom flange was only 297 degs. Fahr.

After the test, the walls of the test chamber were removed and photographs taken from different positions showing the condition of the ceiling and girder coverings, one of which we reproduce, from which it is evident that the beam protection was excellent. It is also apparent that the concrete slabs (marked A in Fig. 7) were superior to the concrete plaster (marked B in Fig. 7); but, in justice to the plaster, it must be remembered that its age was only three days, while the slabs were three weeks old when tested, and although the plaster appeared to

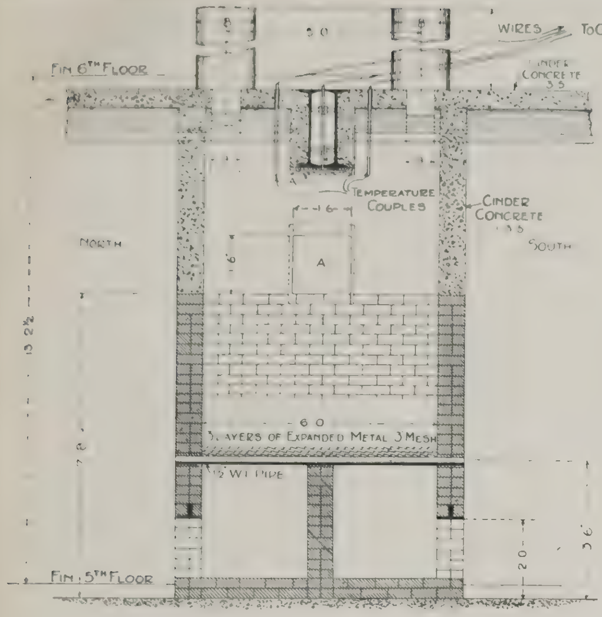


FIG. 6.—NORTH AND SOUTH VERTICAL SECTION OF TEST CHAMBER.

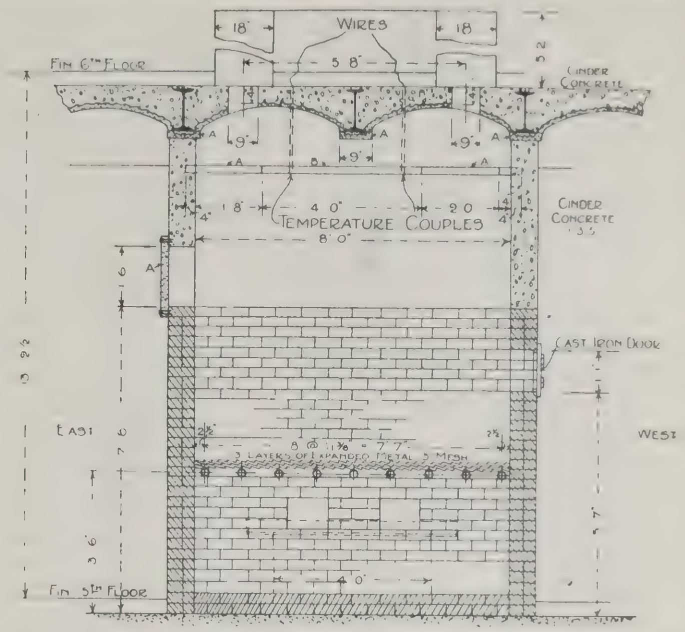


FIG. 7.—EAST AND WEST VERTICAL SECTION OF TEST CHAMBER.

be dry this disparity in age would doubtless have some effect upon its tenacity.

The force of water had washed away a portion of one slab exposing the metal lath by which it was reinforced. Part of the metal lath in the plaster was similarly exposed, but there was this distinctive difference between the two: the lath in the slab was located ½in. from the bottom, so there was practically 1½ins. of cinder-concrete protection still remaining between the lath and the beam, which the water had not disturbed, while in the case of the plaster the lath was wrapped close to the beams, so the only protection between the lath and the beam was the small amount of plaster concrete forced through the mesh in putting it on. This was washed out in places, and the beams exposed. The broken slabs (to be seen in Fig. 4) were not due to the test.

The photograph also shows that the cinder-concrete floor construction went through the test with very slight injury. In fact, that such a fire could be resisted for 2¼ hours without injuring the stability of the structure is conclusive evidence of the fire-resisting efficiency of the whole construction.

Table of Temperature.

Time.	Couple No. 1.*	Couple No. 2.*	Couple, No. 3. (Between I-beams.)	—
	Degs. F.	Degs. F.	Degs.	
2·45	186	312	216	Test started.
3·00	1,143	1,548	225	Heat at the beginning was due to a small fire to dry walls.
3·15	1,413	1,413	238	
3·30	1,573	1,413	249	
3·45	1,624	1,505	258	
4·00	1,912	1,658	269	
4·15	1,768	1,782	269	
4·30	1,847	1,730	288	
4·45	2,011	1,851	297	
5·00	2,043	2,112	297	Test ended
Average	1,619·0	1,576·8	—	

* Both in test chamber.

Description of Illustrations.

Fig. 1 shows the front of the building looking west from Spring Street. The cross in black shows the storey on which the test was made. The building was in this condition when the test was made.

Fig. 2 shows the south elevation of the test chamber. The lower part is of brick 8ins. thick. The bricklayers went on a strike and left the walls when they had them 7ft. high. The upper part was made of cinder concrete 8ins. thick, reinforced with expanded metal, completed twenty-four hours before the test.

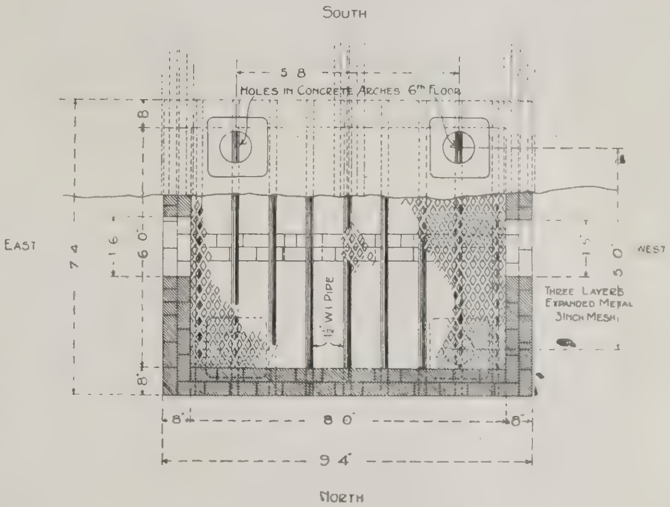
Fig. 3 shows the four chimney flues on the sixth floor. Electric wire terra-cotta conduits were first used for these flues, but the intense heat cracked them, and they were replaced by iron flues. One is shown in the foreground. The flames are easily seen in this photo.

Fig. 4 shows the effect of the fire and water on the beams and girders of the ceiling of the test chamber. The cinder-concrete slabs 2ins. thick were reinforced with metal lath cast in moulds and fastened to the bottom of the beams by wire clips. The cinder concrete of these slabs was made in the proportion of 1 part of Portland cement, 2 parts of sand and 4 parts of screened cinders. These slabs were three weeks old when the test was made. The middle portion (marked B in Fig. 7) consists of a mixture of 1 part of Portland cement, 2 of sand, 2 of Acme plaster and 4 of cinders. This mixture was applied 72 hours before the test with a trowel to metal lath previously wrapped around the bottom flanges of the beams.

Fig. 5 shows plan and horizontal section of the test chamber.

Fig. 6 shows north and south vertical section showing the construction of the walls, gratings, &c., of the test chamber, also the construction of the sixth floor of the building which formed the roof of the test chamber.

Fig. 7 shows east and west vertical section showing the construction of the test chamber. Parts marked A and B are explained above.



South
5 8
Holes in Concrete Arches 6th Floor
East
West
7 4
1 6
6 0
8
8
1½ WI Pipe
Three Layers Expanded Metal 3 Inch Mesh
8
8 0
8
9 4
North

FIG. 5.—PLAN AND HORIZONTAL SECTION OF TEST CHAMBER.

The International Fire Service Council's executive will shortly be meeting, and the final arrangements are to be made as to holding an International Fire Service Congress at Milan in May, 1906.

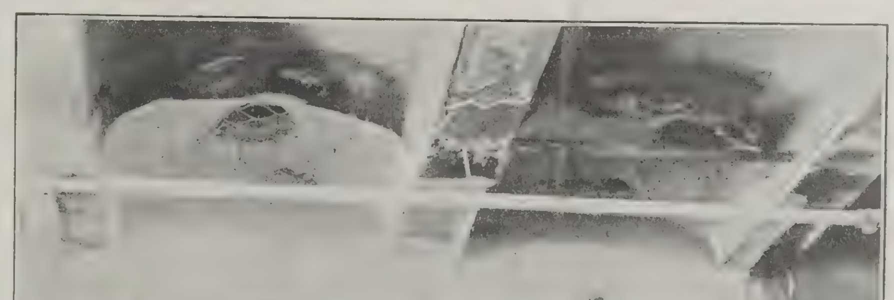


FIG. 4.—CEILING OF FIFTH FLOOR AFTER TEST. METAL EXPOSED ON SMALL BEAMS IN REMOVING WALLS.

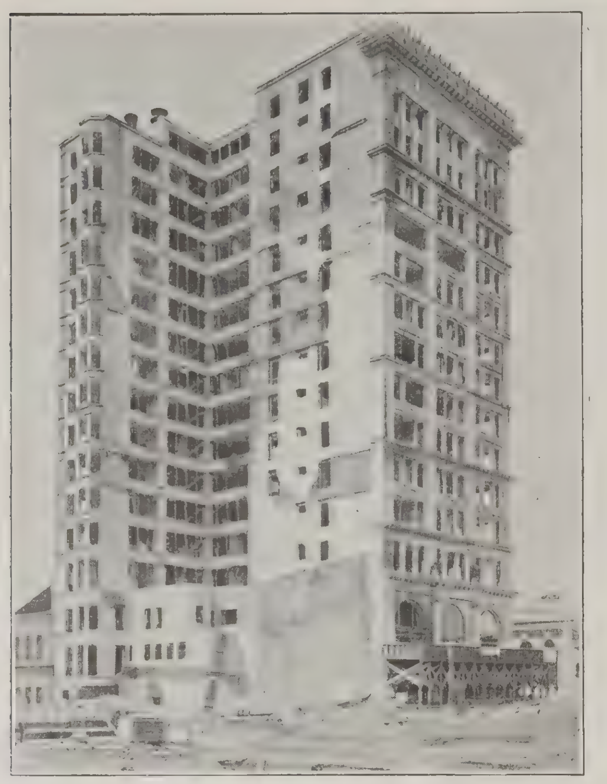


FIG. 1.—THE CONTINENTAL TRUST BUILDING, BALTIMORE, AS LEFT BY THE FIRE.

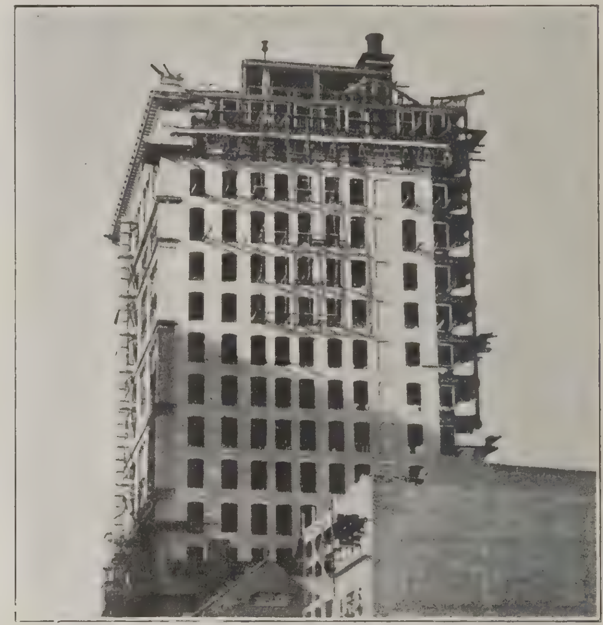


FIG. 5.—NEW SOUTH WALL. *(Photograph taken on October 16th, 1904.)*

RESTORING A FRAME BUILDING.

SO much has been written about the Baltimore fire that we are almost loath to again refer to matters appertaining to that conflagration, nevertheless so much has been said in the public press as to the manner in which the exterior walls of some of the large skyscrapers remained standing, simply requiring nothing more than decorative repair after the fire, that we should like to demonstrate what actually had to be done in the case of the most important of these buildings, namely, the Continental Trust Building. It will be observed that only one of the four front walls of this building was allowed to remain standing, whilst the other three had to be pulled down and rebuilt.

We show the work in its various stages of pulling down and reconstructing, so that there can be no error as to the facts. These illustrations should serve as an object-lesson to those who make premature announcements regarding work of this kind.

The following notes explain the illustrations:—

Fig. 1. This view was taken in May, 1904, and shows the building just as the fire left it. The street covering was erected in March.

Fig. 2. This photograph shows the Baltimore Street front and the east wall in course of removal.

Fig. 3. This view was taken on August 6th, 1904, when the wrecking of the brickwork on the Baltimore Street front had been completed. One storey of the stonework was afterwards removed.

Fig. 4. The Calvert Street front here shown was the only wall which was not ordered by the building inspector to be pulled down; but the contractors were forced to remove even a portion of this.

Fig. 5. This view shows the reconstructed south wall of the Continental Trust Building. The old front bricks from all the walls were used in erecting this wall. The wall on this side was condemned by the building inspector and was demolished down to the fifth-floor level.

Fig. 6. This is a general view of the south and east walls.

Figs. 4, 5 and 6 were taken on October 16th, 1904. When these photographs were sent us the work of reconstructing this building was expected to be finished on March 1st this year.

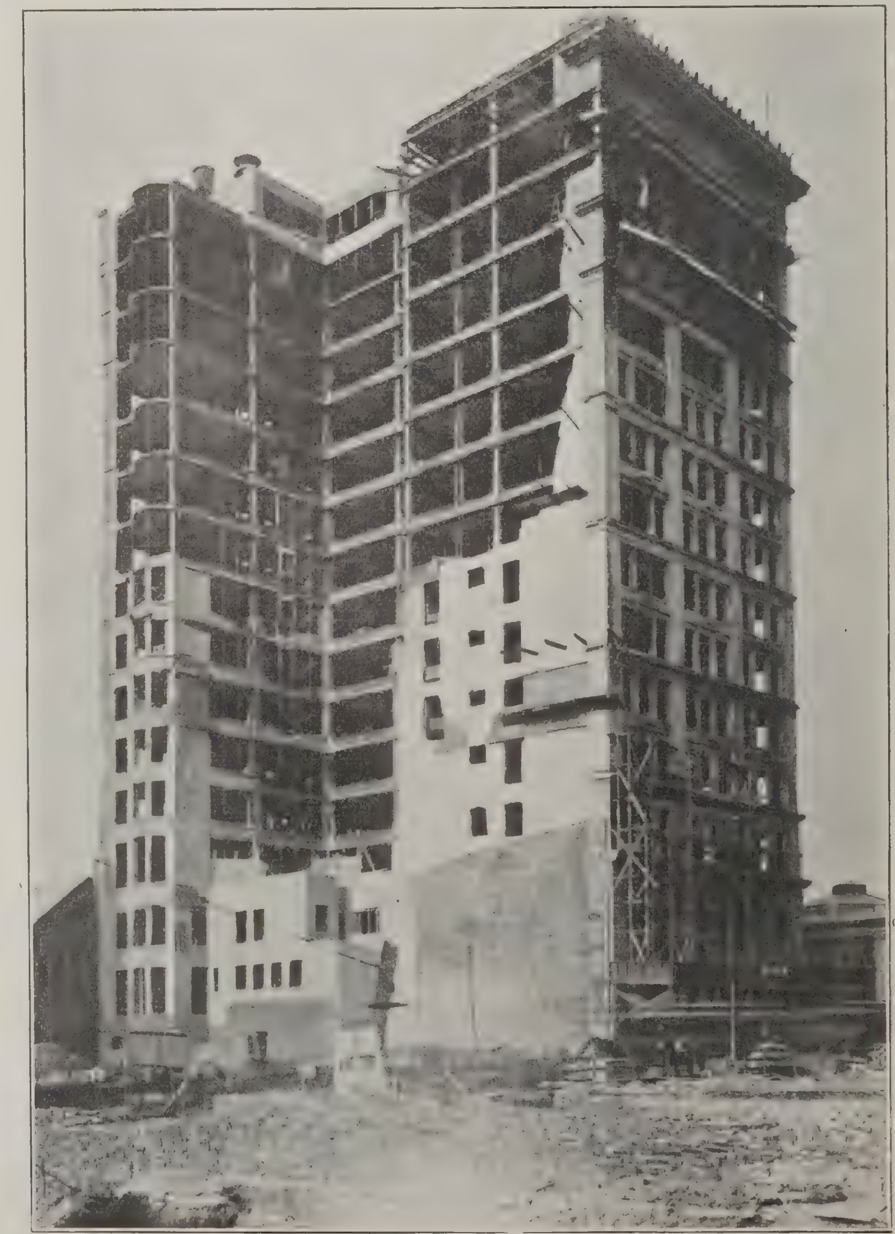


FIG. 2.—THE BALTIMORE STREET FRONT AND EAST WALL IN COURSE OF REMOVAL.

REMARKS ON THE BALTIMORE FIRE

Made at the Budapesth Fire Service Congress by Ellis Marsland, District Surveyor, Camberwell.

The Baltimore fire is one of the most interesting conflagrations of recent years, for

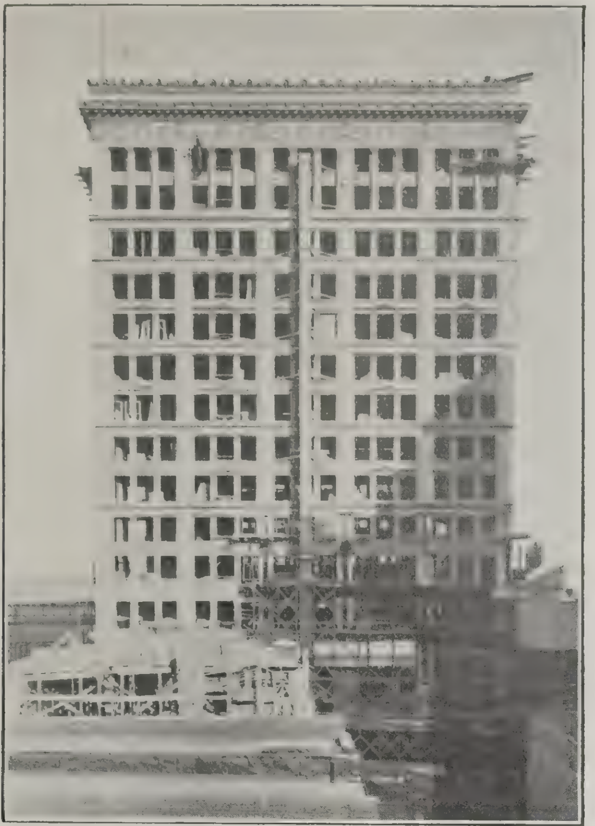


FIG. 4.—THE CALVERT STREET FRONT ON OCTOBER 16TH, 1904.

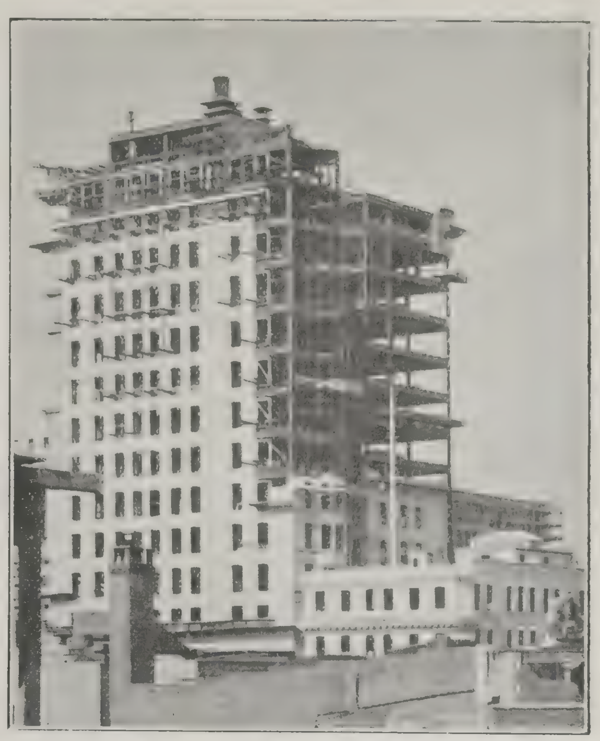


FIG. 6.—SOUTH AND EAST WALLS ON OCTOBER 16TH, 1904.

although it has redemonstrated many facts with which we are already acquainted it has furnished us for the first time with a most thorough and complete example of the behaviour of the modern steel-framed buildings under a severe fire test. It has also shown the weak points in these structures and where greater fire resistance may be effected in the future. It has redemonstrated that all forms of stone are bad fire-resistants and should be but sparingly used in the structure of town buildings. It would of course be impossible to abolish it altogether from an architectural point of view, but where used it should be well backed with brickwork, so that any renewal may be effected without danger to the structures. Indeed, this fire has clearly proved that the only reliable materials are brick and concrete. The hollow tile floor construction and encasing to ironwork of which we have heard so much in certain quarters has largely failed, and would have failed to a greater extent had the fire been less extensive in area and the fire brigade been enabled to put water upon this material, for it is to be remembered that the water test was absent, and we have only the result of intense heat without the sudden cooling.

It may be a cause of general satisfaction that at last a system of construction has been devised whereby the general fabrics may, after a serious conflagration, remain standing, but it is very little consolation to the individual occupier when he can at last return to the scene of his former labours to find that all remains of his office equipment is a building which at the outset he was assured was fireproof and a conglomerate of the remains of a typewriter and a battered iron safe.

It seems to have been overlooked by the designers of these buildings that there was just as much danger from the outside as from within, and perhaps more so, and no provision, or at any rate very inadequate provision, was made for an attack from fire from the exterior. I am quite convinced that had these tall buildings been more adequately equipped with safeguards from without they would have survived the fire, not as a mere constructional shell as we see them to-day, but with more of their internal trim and contents saved from the devouring elements.

In one case where external sprinklers were used at O'Neill & Co.'s store with marked effect, wired glass seems to have resisted the ingress of the flames in a marked degree, and has proved itself worthy of more general adoption, but it requires to be fitted into metal frames, and I think very useful experiments could with advantage be conducted with this material to ascertain the best method of fixing,

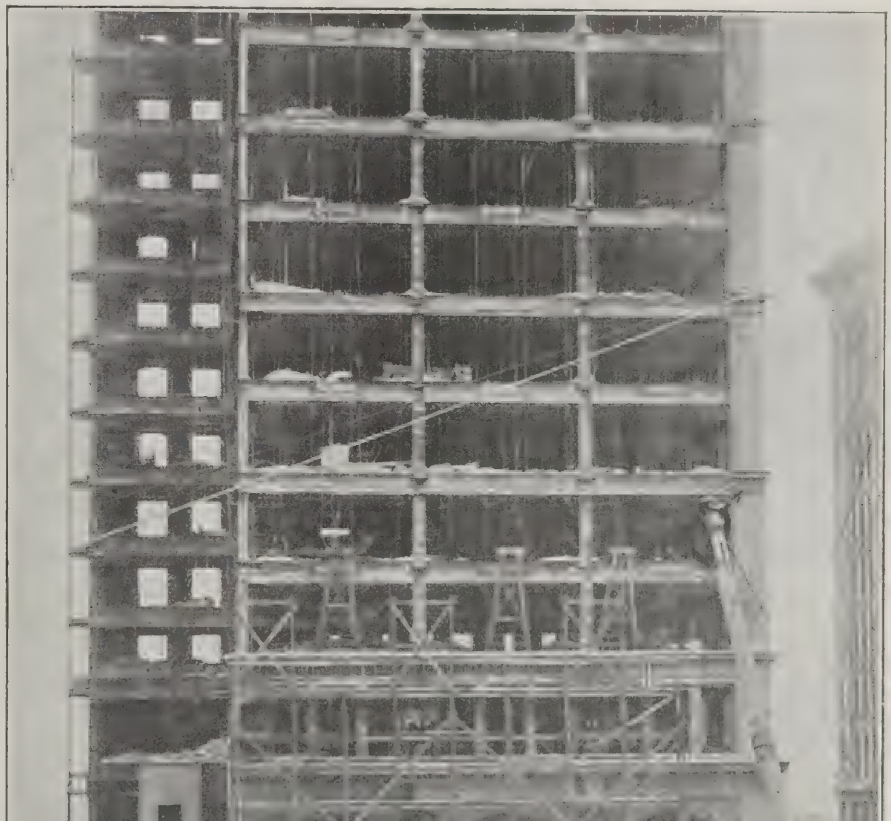
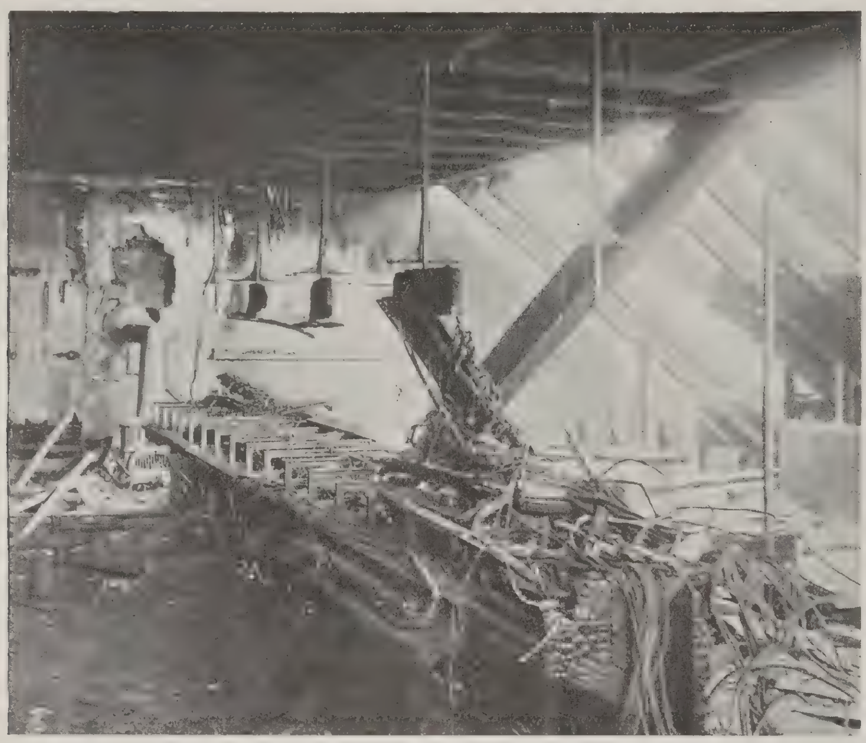


FIG. 3.—THE BALTIMORE STREET FRONT ON AUGUST 6TH, 1904.



THE FIRE AT THE SOUTHERN TELEPHONE EXCHANGE, GLASGOW.

and also whether a double thickness either in the same frame or an inner frame would be more effective. In the paper read at the Fire Prevention Congress in London in 1903 on the new Entrepôt Royal in Antwerp the method of fixing adopted there was illustrated by Chief Officer A. Schepers, to which perhaps I may refer. I am not so sure that this wire-glass is the best material that will eventually be adopted for this purpose of "exposure risk," but it appears to me to be the best material now available; what we require is a transparent material with a higher melting point than ordinary glass, and it is for manufacturers who see the want to supply the need.

This fire has clearly shown that the town building owner must not be allowed to construct his building in the cheapest and flimsiest manner, trusting to the efficiency of the fire brigade to protect him from his neighbour or *vice versa.*

I have carefully examined the plan of the burnt area at Baltimore, and it appears to me that the building regulations want revision so as to limit the cubical contents of buildings. From a rough calculation I find that the cubical contents of the "Hurst" building, where the fire started, was between 700,000 and 800,000 cub. ft. (20,000 and 22,857 cub. metres), and when a building of this cubical extent becomes well alight, its extinction, without adjoining damage, is a matter of great difficulty. What is wanted is a limit to the cubical extent, and any building of the warehouse or storehouse class should be divided into compartments by vertical walls, and all communication between compartments should be properly secured by double iron doors. I cannot help thinking that we in London have been saved from these disastrous fires by this means. We have on some occasions had similar conditions, viz., a fire in a crowded district with a high wind, but although considerable damage has been done, the fire has been stopped mainly by the vertical walls dividing up the buildings. The London Building Acts limit the cubical contents of buildings of the warehouse class to 250,000 cub. ft. (7,142 cub. metres).

It would, I think, be a great advantage in buildings of this class if all roofs would be flat and of fire-resisting material. A flat roof is a great advantage to the fire-fighting force.

Reverting to the material of which fire-resisting floors and roofs are made, I have great faith in coke-breeze or cinder concrete when properly mixed and reinforced with iron, and also as a protection to ironwork generally. My faith is based on actual experiences which the Baltimore fire corroborates. We have at our testing station the roof of one of our huts constructed of this material, and although we have made a number of tests with the same, some of one, two, three and four hours' duration, at a temperature gradually increasing to 2,000 degs., this roof is practically as good as the day it was erected. Hollow tile has shown its deficiencies, but concrete has yet to be defeated.

One word as to staircases and lifts. All holes around such staircases should be encased in brick, and all doors of the same should be made to close automatically; the top should terminate in a light glass roof, easily broken in case of fire, thus a shaft would be formed for the escape of smoke and flames, which thereby would be prevented from penetrating other portions of the structure.

FIRES AT TELEPHONE EXCHANGES.

IN our last "Fire Supplement" (p. 67) we illustrated the recent fire at the telephone exchange in the City of London and drew attention to the hazard of fire occasioned by the telephone service. We are now enabled to supplement this with a photograph of another fire at a telephone exchange, namely, that which occurred in the morning of May 20th, 1902, at the National Telephone Company's Southern Exchange on the attic floor of the four-storey building situated at No. 31, Morrison Street, South Side, Glasgow. This fire is of importance, as it was the means of the National Telephone Company providing fire escapes to all their exchanges throughout the Kingdom. We present the particulars of this fire, together with an illustration, as a further example of the fire hazard attached to telephone operations.

The outbreak occurred in the switch-room and is presumed to have been caused by one of the inspectors, who was engaged making further connections to the switchboard, accidentally causing a lamp to come in contact with the wires. In consequence of the inflammable nature of the insulating material, the switchboard, which contained connections for over 500 subscribers, was immediately enveloped in flames. So quickly did the fire spread that the ordinary means of escape were cut off, and the operators, about a dozen girls, were taken out by the roof on to the top of an adjoining building, from which they had no difficulty in getting away. The outbreak was confined to the apartment in which it originated and the roof thereof, but very considerable damage was done in the flats below by water. Our illustration shows the switch-room after the fire and the roof lights through which the operators escaped.

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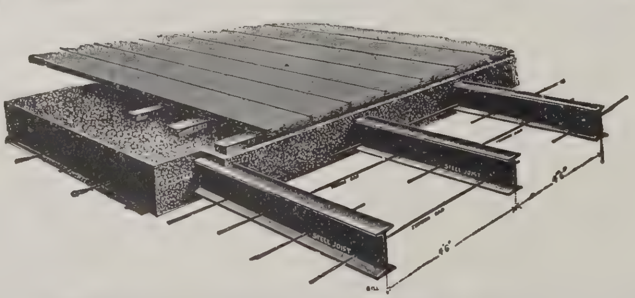


THE

BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

April 19, 1905. Vol. 21, No. 532.

6, Great New Street, Fetter Lane, E.C.

Summary.

A correspondent protests against the proposal to add flying buttresses to the nave of York Minster under Mr. Bodley's direction. These, he says, would be constructionally wrong, for the mediæval builders abandoned the idea of a stone vault over the nave and erected instead a wooden one with little thrust on the clearstory walls. He adds that "a leprosy of new stonework" is spreading from end to end of the building. (Page 209.)

Mr. Middleton, in a letter, says it is an open secret that the large committee which was formed early in 1904 to consider and report upon the principle of registration has prepared a new Registration Bill, or, as it is called, an "Enrolment" Bill, to lay before Parliament, and that this is a weak copy of the existing Registration Bill, "so badly drawn as to be unworkable in practice and containing clauses which could on no account be accepted by the House of Commons." (Page 210.)

At Nottingham the building trade is more sluggish than it has been for twenty years. (Page 206.)

Reinforced concrete has been extensively employed at the new sewage works at Chester. There are twelve precipitation tanks built on a raft of reinforced concrete 200ft. long, 180ft. wide and 21ins. thick. (Page 206.)

It would be highly advantageous to all concerned if the professional and trade associations would draw up standards for paintwork and forms of specification, to which reference could be made so as to secure fair competition. (Page 202.)

The restoration of Culross Abbey is to be proceeded with under the direction of Sir Rowand Anderson. (Page 204.)

In his valedictory address to the Devon and Exeter Architectural Society Mr. Charles Cole said it was evident that some of the leading architects did not quite appreciate the position of affairs in the provinces in regard to registration, and the longer things remained where they were the worse it would be. It seemed obvious that they must all get under one umbrella. (Page 201.)

There is a tendency now to use corrugated iron for the roofs of power stations. This lowers the initial cost, and the reduced weight cheapens the roof-trusses and walls, &c.; it also enables the work to be completed much quicker. (Page 201.)

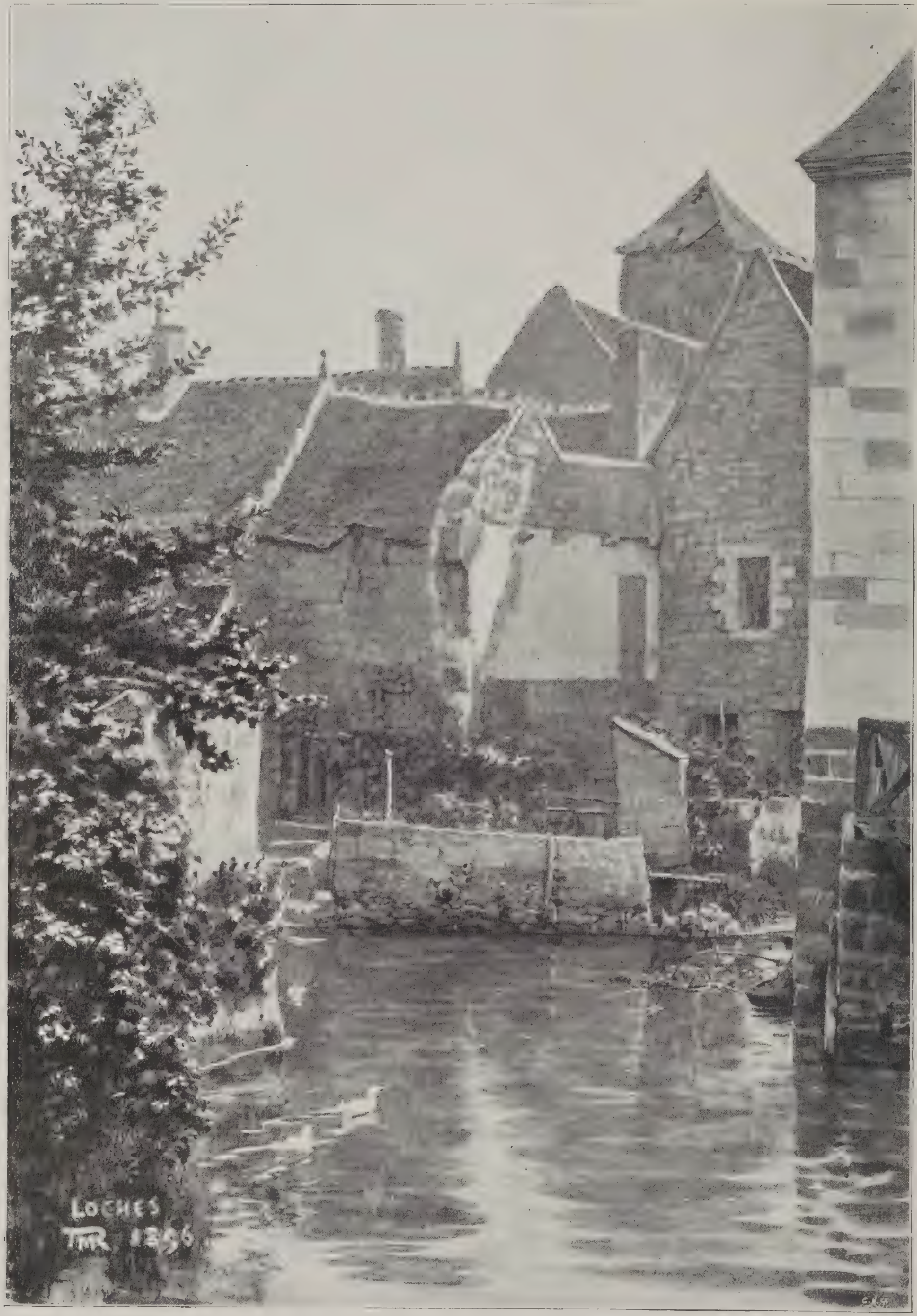
An American firm of heating engineers now advertises complete plans and elevations of the house with every plant! (This page.)

In the course of a paper on garden architecture which he read before the Institute on Monday evening Mr. Mervyn Macartney said we had nothing to learn now from foreign examples and that we had enough in this country to guide us; the best gardens are those which are not slavish copies of other lands. (Page 205.)

Architecture with a Pound of Tea. A SHORT time ago we took occasion to notice a method of supplying house designs which seems to be much in vogue in America. The designs are brought together in book form like so many wallpaper patterns, and for half a dollar you are supposed to become possessed of the most delightful, commodious and ingenious schemes conceivable—and to have all these without paying an architect. The idea has now been extended into the sphere of what we may call "architecture with a pound of tea," for we have before us the advertisement of an American firm of "engineers, architects and manufacturers" wherein is set forth the "factory to consumer" method of selling hot-water heating plants. This is no less than supplying complete blue prints of floor plans, elevations and details, together with specifications and an estimate of cost, to every purchaser of the plant in question: "and all plans are artistic." Moreover, "for 10 cents and the names of two persons who you know expect to build we will send a handsome folder showing floor plans and elevations of twenty-five residences and buildings." While, as if there were not inducement enough in all this, we note that "this advertisement is good for one dollar on the heating contract." The American always seems capable of eclipsing himself, but we hardly see how much farther he can go in this direction. This is selling architecture over the counter with a vengeance.

"Be Gentlemen." WHILE referring to the foregoing it is opportune to note some remarks in the report of a special committee of the Boston Society of Architects appointed to consider certain questions of architects' charges and methods of business. The committee asks why it is that we think an architect is not all that he might be if he competes without compensation or cuts the usual rate of charges? There is nothing immoral about either of these things, unless while doing them one pretends that he does not do them. In what way, then, does an architect differ from the grocer who undersells his neighbour until his profit is of the slightest? In what respect is he like the doctor who does not do so? Is it perhaps based on the fact that professional men sell ideas instead of goods; not drawings but design; not sermons but good counsel; not medicine but sound advice? Is it perhaps founded even more on the fact that to professional men bread-winning, while it is a necessity of life, is not after all what gives them delight in their work? To these questions the committee are unable to give any exact answers, but they are happy to know that, whatever the reason, there is a high professional spirit among architects; and they submit that the best code is that which says "Be a gentleman always and in addition as good an architect as possible." It is of course impossible to lay down any laws on the matter, and for that reason this committee of American architects believes that the only remedy for these evident evils is moral suasion. They think it cannot be too often said and repeated that a commission of 5 per cent. has been long agreed upon as a moderate bread-winning commission for work properly done; that a less charge is unremunerative; that a greater charge is perfectly proper for those whose skill makes them able to obtain it; that anybody who cuts these prices by lowering the rate is really breaking the lowest remunerative market price; that to volunteer, without pay, sketches and competition work is also practically cutting prices, as when a 5 per cent. commission was established as usual and proper for ordinary professional services it was never intended to cover expenditures for obtaining work—that if an architect does this, whether he is young or old, he will earn the name among his fellows of being unduly selfish; he will, in short, be a "hustler," and will have to take the odium that attaches to the name.

O! Presidents. "We weep for you," the walrus said, "we deeply sympathize"—a ballad which has found many an echo during a president's address: for some of the dullest reading is that contained in those quasi-Olympian orations inflicted annually on architectural bodies. The same old story is told again; the same generalities are set forth at much length; the same banners are raised to set aflame the students' eyes; and the proposers and seconders always say what a splendid address they have listened to. But the truth about the matter is very different. 'Tis generally dead stuff. There is no individuality about it. Everybody knows what has taken place throughout the year, and there is no necessity for the president to recapitulate the facts, with a sprinkling of innocuous remarks. What is wanted is a vigorous personal expression of opinion. That opinion may not be shared by many, but at least it interests and brings in some life. In this connection we draw attention to the excellent address which Mr. Charles Cole delivered to the Devon and Exeter Architectural Society last week (see p. 201). There is "go" in this address, and humour, and shrewd criticism withal. Would that other presidents might do likewise and become interesting talkers instead of dull speech-makers.



DRAWINGS OF ARCHITECTURE: T. M. ROOKE.

This drawing made at Beaulieu, by Loches, is a typical example of Mr. Rooke's draughtsmanship. As we mentioned when publishing another of Mr. Rooke's drawings in our issue of December 23rd, 1903, this artist was among Ruskin's favoured few.

DEVON AND EXETER ARCHITECTURAL SOCIETY.

Retiring President's Lively Address.

AT the annual meeting of the Devon and Exeter Architectural Society last week Mr. Charles Cole, the retiring president, delivered an address. After some introductory remarks, he said one would fancy that the

Model By-laws

were drafted by men who had never done any practical work; and as all local authorities copied them to a great extent, they found some very curious anomalies. They must not introduce any clauses suitable to their locality or make any of them at all elastic, or the Board above would refuse to sanction them. So they got the strange state of affairs that a little one-house town in the wilds of nowhere had the same by-laws as a large city. The effect of some by-laws was that in large towns many old buildings were not pulled down and rebuilt because, in addition to light troubles and party-wall questions (which bulked largely), the unfortunate architect had still to deal with local authorities whose views were often "quaint." If there were any elasticity, many a client would rebuild entirely, instead of "tinkering" by taking out a floor, putting up a new front, and so on, often involving a great deal of trouble and anxiety and a liberal use of steel or ironwork. Even if a new building did not quite comply with all the cast-iron rules of the powers that be, it must be a great sanitary advance on old timber buildings, crusted with age and other things in its numerous cavities and worm-eaten woodwork. Perhaps one of the most irritating features of the whole thing was that where a local authority was willing and anxious to frame sensible by-laws to suit its locality, the Local Government Board would have none of them.

Registration; Competitions.

Referring to registration, Mr. Cole said it was gratifying to a great number of provincial architects to know that the Institute had at last come to the conclusion that something must be done, and had actually done something. In this matter the Society of Architects had justified its existence: it had been most loyal throughout and was ever ready to support the Institute and allow it to take the lead. "I do not want to labour the point unduly, but credit must be given where credit is due. It is evident that some of our leading architects do not quite appreciate the position of affairs in the provinces, and the longer things remain as they are the worse it will be. It seems to me to be obvious that we must all get under one umbrella. Old-fashioned notions die hard: the passing of the Medical Act showed that; and now nearly every profession has its central and examining authority, from the lawyers, doctors and accountants to the midwives; only architects remain unpractical and dilatory.

Just One Example.

"What happened to the memorials issued by the R.I.B.A. and its allied societies, and duly forwarded to nearly all local authorities? They were treated generally with silent respect, and allowed to lie on the table; no one took the trouble to read them. Where they are now goodness alone knows! When we are all united we can speak with a louder voice which will carry more weight. With a proper legal status, were we more united I do not think the courts would ride rough-shod over us as they often do now. Take the

Ownership of Drawings

question. 'It is only an architect's matter,' and the greatest injustice is done. The drawings are only the means to an end, and yet, forsooth, a cantankerous client, even if he cannot understand which is the right side up of a plan, may insist on having the drawings handed over to him. They are of little service, and nowadays not even drain plans are as necessary as they used to be, because the manhole covers and gulleys show exactly where the pipes are; and now I note that the Master of the Rolls has lately dismissed Mr. Gibbon's appeal against the decision of Mr. Justice Ridley that he must give up the plans he had prepared for certain flats. Plans of buildings erected during the course of his career, together with his brains and experience, are the architect's stock-in-trade; but unless he goes to the trouble and expense of making tracings, all his records may be swept away. I have pointed out to clients before now that if the drawings are taken away they will assuredly be lost. Time has already on more than two occasions proved the correctness of my statement, and the strayed ones have been restored to the fold. I must say that I think the R.I.B.A., with their splendid income and, if I am correctly informed, substantial reserve, should help the profession, or at least their own members, to fight with all its strength such legal injustice and unfairness.

"I feel sure that

The new Lady Architect

who is an A.R.I.B.A. would, if placed on the Council, wake up the slumberers and help the new and younger blood on the reformed body to greater efforts and a real progressive policy—not too progressive, but just progressive enough.

The Ways of the Enterprising Builder.

"The architect has to face competitors on every hand. The enterprising builder keeps the tracings of various works of which he may become possessed. Even if the architect is sharp enough and insists on their being returned before the issue of the final certificate, an office boy does the needful with pen, ink and tracing paper, and many a clever design is repeated *ad nauseam* in a row of jerry-built houses, or put in a more pretentious building in entirely the wrong position. The auctioneer and house agent has a little field day occasionally, as well as—speak very lowly and with due respect!—the solicitor's clerk.

The Engineer's Bridge.

"The engineer, too, builds a steel bridge and loads the spandrels with tons of cast-iron 'ornament' bolted on securely to prevent the structure from rising on its pin joints or hinges and shaking off its architectural adornments into the river below. Its balustrade panels are Gothic; so are the bases of its electric-light standards—all fearfully and wonderfully designed and made. There are beautiful castings further up the steel posts, but these are not Gothic, and the lamps look down bashfully and admiringly on the bases and wish that they had crochets on their shades.

Competitions.

"Generally speaking, the past year has been one of bad trade, and naturally people do not proceed with new works under such circumstances. Let us hope that matters may improve shortly and find work for a very deserving class, and that those who promote competitions may so draft the conditions that architects may feel that they will be treated fairly. The public and committees generally have only very crude ideas of the enormous amount of work involved in preparing the necessary drawings; and I think that the suggestion of the R.I.B.A. is most excellent—that promoters should pay a successful competitor 1½ per cent. on the estimated cost of a delayed or abandoned scheme. But one may call 'spirits from the vasty deep'; the question is, will they come?

"I do not propose to give the ordinary schedule of works carried out either locally or throughout the country; you can all read that for yourselves; but I really believe the public generally are taking more interest in architects and their works, and one hears less and less every year of the coarse remark or jest that 'they keep the cost of the work up because they are paid a commission on it.' When registration is *un fait accompli* this will die out altogether. We must all endeavour to see that the younger men who come in have a real love for a beautiful art and science and are determined to be a credit to it by being well informed in all its various ramifications; because, after all, even with registration—let me misquote—'the name is but the guinea stamp, the man's the gowd for a' that.'"

Mr. B. Priestley Shires was elected president of the Society for the ensuing year and Mr. Harbottle Reid vice-president.

ROOFS FOR POWER STATIONS.

By E. KILBURN SCOTT, M.I.E.E., A.M.I.C.E.

FOR the roofing of power stations in this country the practice so far has been to use slate, but there is now a tendency to employ corrugated iron. It is lower in initial cost and the reduced weight cheapens the roof-trusses and walls, &c. It is fire-resisting; there being no wood, whereas slates require wood for fastening to. Again, corrugated iron can be erected much quicker, as it is purely an engineering job—an important consideration in these days of hurry-scurry and strikes.

The usual gauge of corrugated sheet is No. 20 B.W.G., this meaning the gauge of the sheet before it is galvanized. After galvanizing with, say, 3 ozs. of zinc per square foot of surface, the galvanized sheet should measure between No. 18 and 19 B.W.G. In order that the sheet shall be of the proper thickness it is most necessary to specify exactly what the gauge is to be before galvanizing.

Specially tight joints are made by inserting between the edges of the sheets strips of canvas or loose cord which have been soaked in white lead paint. This gives a dust-proof joint, but, as a matter of fact, the ordinary overlap joint is quite good enough for the boiler-house and car-shed. The end-lap of the sheets is usually about 6ins., and the side lap two corrugations. The hook bolts which clip the sheets down on to the purlins should always be placed on the ridges of the corrugations.

Condensation of moisture on the inside of the corrugated iron sheets may cause drops of water to accumulate and fall from the edges of the purlins on to the machinery. Good ventilation will, however, go a long way towards preventing this, and the employment of the Thomas fitting will ensure that the water is not intercepted at the purlins. The Thomas fitting consists of a saddle resting on the purlin and having a convex projection immediately around the hook bolt. The washer of the hook bolt has a concave underneath surface, so that when tightened down the corrugated iron sheet becomes embossed to the shape of the convex part of the saddle, thus rendering leakages impossible. The saddle also serves another purpose in keeping the corrugated iron sheet about ¼in. clear of the purlin and so preventing the interception of condensation water by the purlin.

Painting is an important matter in the corrugated iron roof. The first coat must be oxide or iron paint, lead paint being used for further coats. It should be noted that this first coat is not required until the galvanized roof has been erected for some time and the surface has become sufficiently dulled to form a "key" for the paint.

Regarding the painting of the roof-trusses and other ironwork, this should be carefully done, the steel being thoroughly cleaned from scale and rust and a first coat applied at once, to be followed by another immediately after erection. Cast-iron, having a natural skin when it leaves the foundry, should receive its first coat before rusting has begun. The roof-trusses, &c., should be painted at regular intervals, for the proverbial pennyworth of tar is very true of metal roof structures.

A common method of ventilating an engine-room is by means of louvres running right along the ridge. In an iron roof such ventilation is arranged by leaving out sheeting at the crown of the roof and having a wider sheeting supported on standards sufficiently high to allow for the outcoming air currents. The spaces between the top row of sheeting and the roof proper is filled in with louvres, which for the car-shed and boiler-house should be fixed, but in the case of the engine-house must be arranged so that they can be opened and closed.

Occasionally this opening and closing gear may get out of order, and even when the louvres are supposed to be closed they may leak a certain amount of water during a gale. The writer is therefore inclined to the opinion that the best way to ventilate an engine-house is by means of large electrically-driven fans in the end walls, the roof being made as tight as it possibly can be.

Regarding roof lights, these should never be placed immediately over the dynamo machinery, because if a pane breaks or any water leaks through it will fall directly on to the dynamos, which are the most delicate machines in the whole station. If a roof light is employed at all it should be immediately over the engines, as the engines are usually next to the boiler-house wall. This fits in very well, for the wall on the dynamo side of the engine-house can generally be fitted with windows running from 3ft. or 4ft. above the floor to nearly up to crane level.

One important thing to take note of in connection with roof lighting is that the lights should not be next to the louvre, as, if so, any snow or ice, &c., dropping from the edge of the louvre on to the glass below may possibly break through. The writer noticed this defective design had been adopted on the large car-sheds of the London United Tramways Co. at Twickenham.

It goes almost without saying that the glazing must be without putty, for it would most certainly shake out with the vibration, and, in any case, the glass must be capable of being quickly and easily renewed. The method of glazing adopted should be such that it will allow of expansion and contraction of the roof without breaking the glass, whilst the fastenings should be so placed that they are protected from corrosion. Almost all of the several kinds of patent glazing on the market nowadays are good, for only the fittest have survived.

A steel ladder should be made a permanent fixture against the power-house wall, so that there may be no delay in repairing leaks or a pane of glass, &c.

Obituary.

Mr. Frank Caws, F.R.I.B.A., architect, of Sunderland, died recently from an attack of pneumonia. He was in his sixtieth year. He went to Sunderland about forty years ago from the Isle of Wight. While serving his articles at the latter place, he was closely connected with the building of the Eddystone Lighthouse, the predecessor of the present structure. For two years in succession recently he was president of the Northern Architectural Association. Besides being an architect of ability, he excelled in mathematics and was the inventor of an apparatus for determining the measure of a ship's resistance.

PAINTS AND PAINTWORK.—I.

THE subject of paints and painting is a very important one to the building trades generally; yet it seems to be neglected by the majority of persons. There are few things about which there is more misunderstanding than paint and paintwork. The manufacturers, it is true, have adopted scientific methods and cannot be reproached as a body, but users are woefully ignorant of the matter. Of late years somewhat more attention has been directed to the subject by reason of the advent of washable distempers or water paints and the increasing use of well-advertised enamels.

Badly-drawn Specifications.

Many architects' specifications contain clauses which are almost ludicrous, and lead only to annoyance and many malpractices. Architects seldom safeguard their clients' or their own interests, the want of any standard of work and the loose wording as to materials resulting in the wholesale adulteration and the substitution of inferior work by contractors and master-decorators who are not over scrupulous. Workmanship is specified to be of "the best," whereas the interpretation of the architect differs on every job, for he would never require the paintwork of a cottage to be equal to that of a mansion or a public building. In the same way we find two or three coats specified when one coat of good paint properly put on might be better than these three coats improperly done. Again, materials are specified to be "pure"—but, as many colours and mediums vary in composition according to their natural condition and contain in varying amount what may be regarded chemically as impurities, the stipulation is only to be regarded as fatuous. A white lead may be "pure," chemically speaking, but distinctly inferior to that made by the old stack process and more or less unequal in composition.

Decorators' Want of Knowledge.

For the ignorance of architects there is plenty of excuse, if not for their neglect of proper precautions; but decorators—both craftsmen and masters—are almost equally uninformed. They know little or nothing of the chemistry of the subject in which they specialize, and go about their work in an unscientific manner. They compound their paints from the cheapest ingredients, and, consequently, generally produce inferior results that are dear in the long run. They admix colours which deleteriously affect each other or the oil, and use dirty brushes, &c. The usual excuse is to blame the varnish, which is more to be relied upon, unless it has been bought at a price which, if it were known, would immediately disprove its genuineness. Seldom is a record kept of the proportions of the ingredients used in any paint, so as to be able to compound it again, while as to colour mixing, matching tints and harmony, it were almost as if the existence of any basis to work on had never been dreamt of.

Our Programme.

With the object of throwing some light upon this subject we have arranged for a short series of articles on paints and paintwork. These will be written so as to be understandable to anyone without a previous chemical knowledge, yet at the same time we hope to make them scientific and instructive of the underlying chemical and physical causes of the results obtained. We shall begin with a general explanation of some of the terminology and a short scientific introduction before proceeding to treat the various branches of the subject in detail. We shall deal with the manufacture of colours, oils, varnishes, &c., only so far as important to architects and other users. Future articles will treat of pigments, oils, driers, varnishes, enamels, size, distempers, stains, colour-mixing, workmanship, brushes, tools, plant, durability of paints, tests, &c.

Standards Wanted.

It would be highly advantageous to all concerned if the professional and trade associations would draw up standards for paintwork and forms of specification, to which reference could be made so as to secure fair competition. A year or two ago the Institute of British Decorators published two forms of conditions of contract for the use of decorators, and this appears to be the only organized attempt to deal with the abuses in the trade; little attention, however, has been paid to it. Such isolated effort is praiseworthy but can do very little good. Architects have a right to a say in the matter, and what is wanted is for a joint committee to be appointed by the Royal Institute of British Architects, the Surveyors' Institution, the Institution of Civil Engineers, the Institute of Builders and the painters' and decorators' associations to enquire into the matter and draw up standards for specifications, issue a series of standardized specimen examples for reference, and state tests for durability.

The Functions of Paints.

The functions of paintwork are two:—(1) preservation and (2) coloration. Under the first heading is included the durability of paints and their application with the object of giving a cleanly appearance and surface and maintaining it, and its sanitary bearing. Under the second heading we can include all decorative effects to be obtained by the use of paints. The first is the more important of the two functions of paints.

Paint in a general sense consists of a pigment and a vehicle, but the word is more particularly confined to a pigment mixed with oil. Distemper is a pigment mixed with water.

Paint dries by the oxidation of the oil, which latter hardens, so binding the pigment. It is diluted or thinned out, generally by turpentine, which evaporates away in the drying. The oil forms a protective coating and offers resistance to the pigment being washed or rubbed away.

Distemper becomes set by the drying of the water, but the necessary binding of the pigment comes from a fixing agent, such as size, glue or casein. Washable distempers have just sufficient vehicle incorporated with them to render them insoluble in water after once drying.

The oil in paints makes them dry with a gloss, whereas distemper dries with a dull surface.

Varnish is added to paint to increase its hardness of surface, to hasten its drying, and to increase its lustre (this last not always, for there are "encaustic" or "dead" varnishes, which give a lustreless surface).

Tar, some stains, and varnish and lacquer used alone and not for coating paint are other classes of materials used for the dual purpose of preservation and coloration, and belong to the same category as paints, but cannot be called so, as they contain no free pigment, and are more or less distinct chemical compounds rather than mixtures.

Definitions.

Before proceeding to the scientific study of paint substances it would be as well to define the nomenclature employed other than the foregoing:—

A thinner is a diluent substance, having the purpose of rendering paint more easy of spreading, so producing a thinner and less glossy coat. Turpentine is the usual thinner.

Clairecolle, or clearcole, is a solution the purpose of which is to render a surface non-absorbent of paint or distemper (and equally so all over).

A filler is a substance or pigment added not for its colour but to (1) increase the body or thicken a paint and so economize by saving in the quantity of the colouring pigment, or (2) to render it more durable. It is often required for both purposes.

Driers are substances which hasten the oxidation of the oil in paints.

Stains are colouring substances which change the hue of a surface without obscuring the texture or grain. This colouring may be due to the use of transparent colours in solution or thinly suspended, or to chemical action with the surface to which the stains are applied.

Polishes are varieties of varnishes which require friction to bring them to a smooth glossy surface.

Lacquers are a species of varnish used for the protection and colouring of metallic surfaces.

Enamels are paints compounded with varnish. The term originally stood for a paint consisting of a metallic oxide, ground in oil and mixed with petroleum spirit, holding some resinous matter in solution, but the term now includes any pigment ground in varnish, or in oil or spirit to which resin or gum has been added.

Knotting is any substance used for preventing the exudation of resin from knots in the wood.

Priming is the operation of applying the first coat of paint, called the priming coat, and has the object of filling up the pores of the wood to prevent absorption of the next coat.

Stopping consists of a plaster or putty for filling up cavities or inequalities in a surface to ensure an even coat of paint.

Flatting is paint that dries with a lustreless surface, and this is secured by a preponderance of diluent over oil in its composition.

Combing is the streaking of a flat tint with another, performed by putting one coat on another, and while the second is wet wiping away parts with the teeth of a comb.

Graining is the imitation of wood, and is done in a similar way to combing, except that other instruments are used in addition to combs and other colours may be put in with a brush.

Marbling is the same, only in imitation of marble instead of wood.

Stippling is the operation of applying paint without stroking or smearing it on with a brush, being performed by dabbing with brushes of special form. It has for its object the production of an even, flat, lustreless surface free from brush-marks.

Ropiness is the term used to express the state of a corded surface, which is the too apparent use of the brush. The term is also applied to paint when it is thick and sticky and holds together like treacle.

Ladders is a term used to express the missed places in the finishing coat, showing the transverse laying-off between the final brush strokes.

Cissing is the term given to the contractile action of water or paint upon a very oily surface of new paint, frequently found in varnishing oil paint.

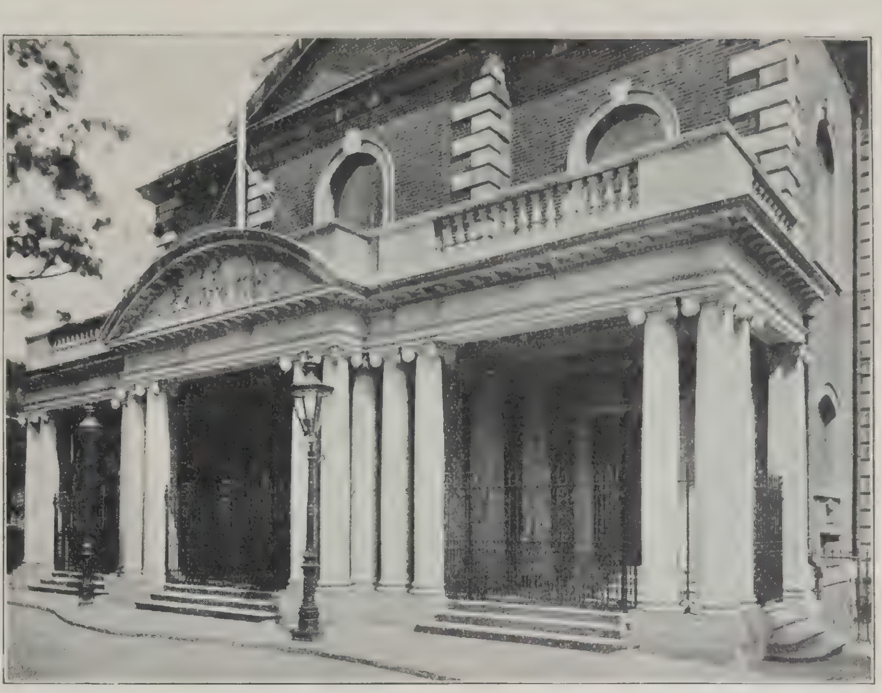
Striking or flashing is the name given to the occurrence of oily or shiny patches in flatted work.

Blooming is the term applied to the gathering of a sort of mist upon a varnished surface.

(To be continued.)

An Article on "How to be an Architect" appears in "T. P.'s Weekly" for April 14th.

The United Methodist Free Church and Schools, Seven Kings, has been erected from designs by Messrs. George Baines & Son, 5, Clement's Inn, Strand, W.C. The portion of the building completed embraces the nave and a temporary apse, with tower and spire, main schoolroom, superintendents' room, &c. The contract for this portion was £3,488. The church accommodates 400 persons in a mixed congregation.



NEW WEST PORCH TO ST. MARY'S CHURCH, ISLINGTON.
SIR ARTHUR BLOMFIELD AND SONS, ARCHITECTS.

This porch forms a portion of the extensive additions and alterations carried out last year at the church, which was built originally in 1754. Projects for improvements, and even for entire rebuilding, were entertained for some years before it was decided to carry out the work completed last year. Careful repairs to the tower and spire were first undertaken, while at the same time the building of the chancel and aisles, with the vestries and muniment room below, was decided on. Considerable alterations were made to the existing nave, including repairs to, and strengthening of the roof. The side galleries were set back, and the whole of the seating was altered and adapted to modern ideas of church accommodation. Complete redecoration was also carried out, and a general transformation effected of the hitherto dingy and depressing interior. The whole of the works were carried out by Messrs. Dove Brothers, builders, of Islington, under the superintendence of the architects, Sir Arthur Blomfield & Sons.

Keystones.

Preston School Competition.—The competition for a new council school in Roebuck Street, Preston, has been decided as follows:—First premium (£50), Mr. Herbert Howarth, Morecambe; second premium (£30), Mr. A. Brocklehurst, Manchester; third premium (£20), Mr. F. Quentery Farmer, Liverpool.

The Crossley Sanatorium for Consumptives in Delamere Forest, which will probably be opened formally by the King in July, has been erected at a cost of more than £70,000 from designs by Mr. W. Cecil Hardisty, of Manchester, who visited the German sanatoria before preparing the design. The sanatorium faces almost due south and the windows of all the patients' rooms open down to the floor. There are twenty-four patients' rooms with single beds and one with two beds, ten wards with four beds, and four wards with six beds. From the main building a covered corridor leads to the chapel and the dining hall, beyond which are the kitchens, nurses' and servants' dining halls, storerooms and pantries. The patients' dining hall is 60ft. long by 40ft. wide, and has twelve tables, each to accommodate eight persons. The chapel will provide accommodation for 150 persons. All floors, in corridors, wards and halls, including the chapel, have been covered with linoleum, of which material 18 tons have been used. It was thought that it would be warmer and quieter than terrazzo, and more comfortable than the usual waxed ward floor.

Work at the Palace of Knossos, in Crete, was resumed about three weeks ago, and there are now about a hundred workmen occupied in excavating further the additional magazines west of the building. The throne-room is now roofed in and protected by an iron gate, and the two Mycenæan columns have been restored from the existing fragments and from indications of similar columns which occur in the frescoes. The colouring of the interior has been renewed sufficiently to give some idea of the original effect. This is the most complete attempt at restoration, but elsewhere walls have been strengthened at all important points and staircases built to facilitate access from one level to another, so that the meaning of the several portions of this most complicated series of courts and chambers might be made as clear as possible. Funds, however, is still needed to continue the work.

Sheffield Society of Architects and Surveyors.—The annual meeting of this Society was held on Thursday last. The accounts showed a satisfactory increase of the balance in hand to last year. The annual report of the council stated the membership at 120, being the highest number in the Society's record. It was announced that in consequence of increasing public duties Mr. Fenton wished to be relieved from his office of secretary, which he had held for eight years; a special vote of thanks was accorded to him. The following elections for the ensuing year took place:—President, Mr. E. Holmes; vice-president, Mr. W. C. Fenton; treasurer, Mr. F. Fowler; secretary, Mr. J. R. Wigfull; Council: past presidents, Messrs. E. M. Gibbs, C. Hadfield, R. W. Fowler, Joseph Smith, P. Marshall, T. Winder; fellows, Messrs. H. Coverdale, W. J. Hale, J. B. Mitchell-Withers, H. L. Paterson, A. E. Turnell and C. B. Flockton; associates, Messrs. C. M. Hadfield, C. F. Innocent and H. I. Potter. A prize of £5 5s. for the best set of measured drawings was awarded to Mr. J. M. Jenkinson.

Architecture at the Royal Scottish Academy is represented less adequately this year than formerly, but photographic illustrations are plentiful. Mr. J. J. Burnet shows his premises for the Professional and Civil Service Supply Association; Mr. Cullen the Lanark District Offices, Hamilton; Mr. J. Macintyre Henry the Mid Lothian County Buildings; Sir Rowand Anderson the Archers' Hall and the Scottish Conservative Club; and Mr. John A. Campbell the Edinburgh Life Assurance Office now erecting in Glasgow.

Among the domestic work is Mr. Lorimer's Pitkerro, Forfarshire (the restoration and addition to an old Scottish mansion), and High Barn, Surrey.

The Proposal to build a new Chancel at Carisbrooke Church has been defeated.

Mr. Ritz, of the Ritz Hotel, is building a villa in the Bois de Boulogne, Paris, every detail of which is being designed by himself; no architect is employed.

A new Catholic Church at Willington, Durham, has been built at a cost of about £4,500 from designs by Messrs. Kelly & Dick, of London. Mr. Hopper, of Wolsingham, was the contractor.

The Exhibition of Carpentry and Joinery and Woodcarving which will be held at Carpenters' Hall, London Wall, under the joint auspices of the Worshipful Companies of Carpenters and Joiners, will be opened on June 19th by Lord Avebury.

Competition for Crookes Congregational Church, Sheffield. — Mr. E. M. Gibbs, F.R.I.B.A., has made the awards in this competition as follows:— First premium (£20), Mr. W. J. Hale; second (£10), Mr. W. T. Campsall.

No. 15, South Square, Gray's Inn.—The protest of the Society for the Preservation of Ancient Buildings against the demolition of this house—one of the oldest parts of the Inn—has had no effect, and the building is now almost completely pulled down. A new common-room is to be erected on the site.

The Bishop Walsham How Memorial at Wakefield Cathedral, consisting of an addition to the choir designed by the late Mr. Pearson, R.A., and completed under the superintendence of his son, Mr. Frank Pearson, will be consecrated on Easter Thursday. The total cost (including a recumbent effigy of the late bishop) will be £50,000.

New Town Hall, Durban.—Messrs. Scott & Hudson, architects, of Johannesburg and Durban, write stating that the drawing of the new town hall for Durban reproduced in our issue for January 25th last gives a wrong impression of the building, for, since it was made, an almost complete revision has been effected in the matter of detail. They also point out that the firm in whose favour the competition was decided was Messrs. H. E. Woollacott, Scott & Hudson, now Scott & Hudson as above.

Culross Abbey Restoration.—After a delay of more than a year, the heritors have decided to go on with the repair and restoration of Culross Abbey. Plans have been prepared by Sir Rowand Anderson. The east and south galleries will be removed, as well as all the seating and woodwork in the area of the church, the seating accommodation lost by the abolition of the galleries being provided by restoring the north chancel aisle and the aisle on the east side of the south transept. Other works to be executed comprise entirely re-roofing, laying wood-block floor, and reglazing all windows. The cost of the scheme is estimated at £4,400.

New Flats at Victoria.—The contract for the erection of a block of flats to be known as "Cathedral Mansions," Nos. 258 - 266, Vauxhall Bridge Road, Victoria, has been signed between Mr. Tod Heatley, Messrs. D'Eresby House Ltd., and Mr. C. Gra, contractor, of Kensington and Shepherd's Bush, and the work is to be commenced at once. There are many novel features in the planning, and there will be a roof garden for use of tenants. The elevation will be carried out in cherry-red bricks, gauged work and dressings of terra-cotta by Dennis of Ruabon, from full-size details for modelling by the architects, Messrs. Palgrave & Co., of Westminster. Mr. Farrell is the clerk of works.

Kingsway will be opened for vehicular traffic before the end of the year.

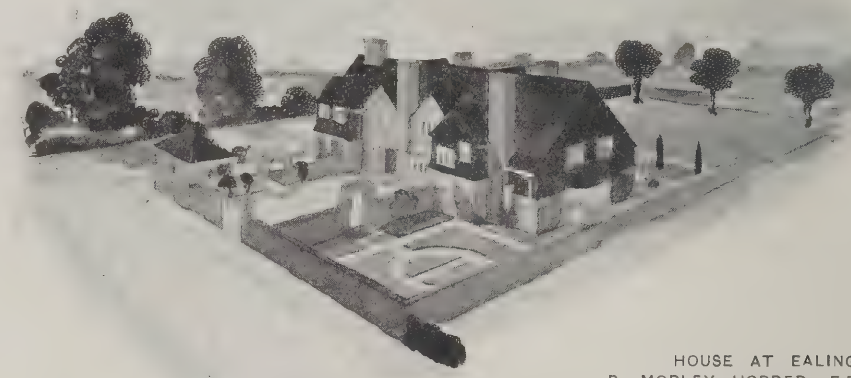
A Competition for new Baths at South Kilburn is to be held. Premiums of £100 and £50 will be offered.

A Large Roman Bath has been discovered in the Commune of Montreale, in the Department of the Ain, France. The site is believed to be that of a Roman villa.

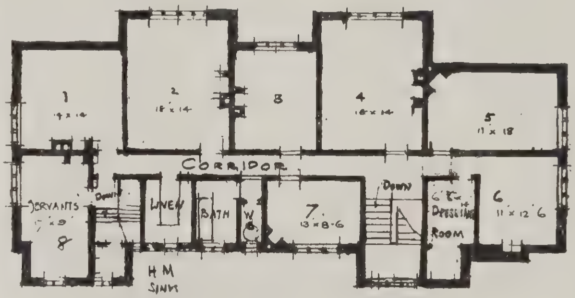
Remains of Old Bridewell Palace Found.—In excavations for a new building on land belonging to Bridewell Hospital in Water Lane, City, arches and piers have been found which, it is said, may have formed part of old Bridewell Palace. The walls rested on brick arches, with chalk and mortar abutments placed on piles and planking, the latter laid on loose soil.

The Proposal to beautify Trafalgar Square by introducing grass, shrubs and flower-beds has been rejected by the London County Council because the Square would no longer be a place of meeting for working men.

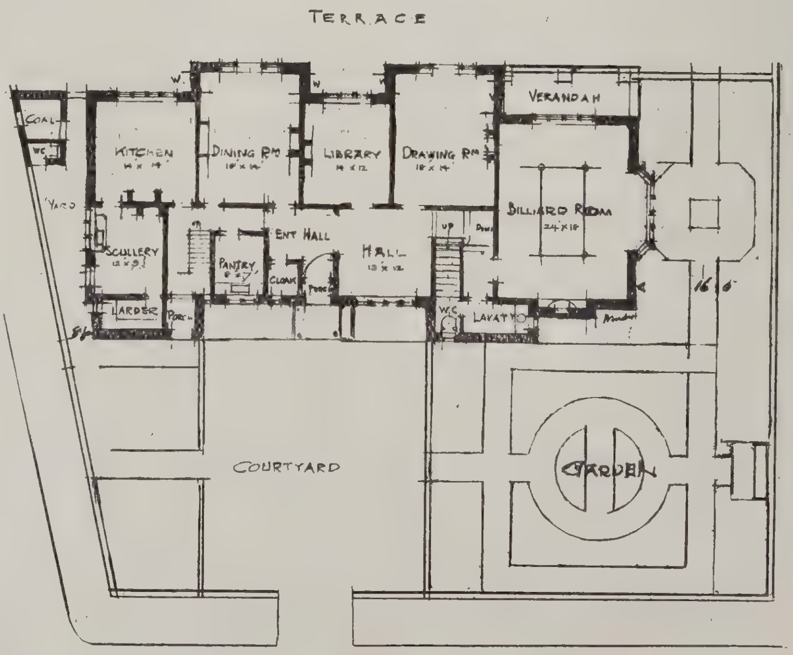
"Cathedral of the Peak" Restored.—A special service was recently held in Tideswell Church, when the Lord Bishop of Southwell dedicated the restoration work which has been carried out at the west end of the church under the direction of Mr. J. Oldrid Scott. The one great blot on the church was the gallery erected in 1826, under the tower. Some time ago a faculty was obtained for its removal, and the work was voluntarily done by members of the congregation. The new work just completed includes oak porches, screen and doors.



HOUSE AT EALING.
P. MORLEY HORDER, F.R.I.B.A., ARCHITECT.



FIRST FLOOR PLAN



This house was designed for a client who desired a roomy house costing about £3,000, kept long and low and as little like the neighbouring villa type as possible. There is a good panelled hall inside and, generally, the house is finished in the best way. The walls are treated with rough-cast and tile-hanging, with red bricks and red tiled roof. The little building shown at one corner of the forecourt is for a motor-house.

R.I.B.A.

Mr. Macartney on Garden Architecture.

A MEETING of the Royal Institute of British Architects was held at 9, Conduit Street, W., on Monday evening, the chair being occupied by the president, Mr. John Belcher, A.R.A.

The decease of Mr. Francis Edward Caws, Fellow, was announced.

Mr. Mervyn Macartney then read a paper on "Garden Architecture."

The author thought that scarcely any subject had been so exhaustively studied of late years as that of Garden Architecture, and heated controversies had been waged over the rival advantages of formal and informal gardens. At present the former held the field, and he hoped that in this case fashion would prove constant. Citing some ancient instances of formal gardens, the author quoted at length the graphic description given by

The Younger Pliny

of his villa garden, with its spaciously well-proportioned portico, in front of which was "a sort of terrace, embellished with various figures and bounded by a box hedge, from whence you descend by an easy slope adorned with divers animals in box answering alternately to each other into a lawn overspread with the soft acanthus: this is surrounded by a walk enclosed with tonsile evergreens shaped into a variety of forms." Later, there were the formal and natural schools as represented by Lucullus and Martial, fighting the "Battle of the Styles" even thus early.

The author confessed he could not see why in the construction of a garden human thought and labour should be eschewed. The most interesting examples were those on which the greatest skill had been expended. Not that the larger the amount of wall and terrace employed the better the result. It was possible to overdo these and produce failure. In the case of

Versailles

there was a sense of enormous effort with little result. Vast terraces, lagoons of water and huge fountains produced no satisfactory result, only a sense of futility, a useless expenditure of labour and money without adequate return.

Turning to some English examples the author said: "Montacute, to my mind, is the most satisfactory: it fits the position, and yet, like so many other English and British examples, it owes little to site. It is comparatively flat, and there is no distant view. What charms it has are of its own making. So it is with Wilton and Melbourne, and herein lies

A Difference from the Italian Examples.

"They generally owe a great deal to position: perched on a hill you have vistas of distant country framed by towering cypresses into delightful pictures. Yet in the British examples you have a distinct sentiment; it is of a garden that you love—a charm that can only be gained by the employment of rare knowledge and design. There is a subtle charm about the terrace at Haddon Hall and the bowling green at Bramshill that is absolutely absent in Trentham or Versailles. There is no great striving after effect. I would rather be the designer of Montacute than Versailles—I will go farther and say of the Haddon Hall terrace rather than Versailles. Indeed, there are few of the vast garden conceptions that please me. Chatsworth bores me, so does the Crystal Palace; yet they are laid out on grand lines: they are meant for spectacular performances, and unless all the fountains are playing the effect is dismal as an empty theatre."

The Gardens placed on Hills

give the architect an opportunity of showing his skill in designing terraces, balustrades and steps. Some of these in the Italian gardens were wonderfully ingenious and beautiful. Water as part of the garden design was very largely taken into account by the Italians. Garden flowers were no part of the scheme, and scarcely came in at all. Architectural features and evergreen trees were the two principal factors in considering the effect to be produced. Antique fragments such as vases, urns, capitals, altars, &c., were largely used, some as cisterns, others as receptacles for plants, &c. These were useful to lighten up the sombre depths of the ilex groves, and were suitable in that climate; but here they look cold and unhappy.

The author exhibited lantern views of various notable examples of Italian gardens to show what masters in their art and craft their designers were. Remarking on the essential differences between English and French, Italian and Spanish gardens, the author referred to the beauty of the English lawns. Abroad they could only be obtained by great care and attention, and are a source of trouble and difficulty. Shade, too, in those countries was of vital necessity. Here it rarely was the case, and many of the pergolas that people were so enamoured of were

Nasty Damp Places

totally unfitted for the climate. A third point was the effect of strong sunlight and heat. A marble seat here was a very uncomfortable place to sit on. It was generally damp and cold, and therefore unsuited to our climate.

The author next dealt in considerable detail with home gardens, showing examples of different ways of treating some of the many factors that make up the sum of an architectural composition—such as terraces, steps, &c. As regards the width of terraces, there was more chance of failure by putting a narrow terrace than a broad one. Generally speaking, the width was largely governed by the amount of surplus earth excavated from the foundations. If the site was a very steep one the terraces were usually narrow.

Balustrades

admitted of much play of fancy. The turned baluster was very commonly used, and the author favoured the widely spaced English work. Quaint terminals on the piers, and also pavilions at intervals and at the corners, were introduced to vary the monotony of lengthy balustrades. Montacute was a case in point; the play of fancy in this design was very happy. Other architectural details referred to and illustrated were gate piers, fountains, ponds, sundials, pavements.

Summing up his own views on the subject, the author said that if he were called on to lay-out an extensive garden site in England he should avoid geometrical beds—those unhappy compositions with shapes like tadpoles, kidneys, &c. Neither should he embark on topiary work on any great scale. Hedges of yew, privet, hornbeam, &c., were charme ing adjuncts to a garden, and here and ther-trimmed shrubs were useful; but he could not admire Levens, Elvaston or Blickling.

As our country is the most beautiful

in the world, he would take advantage of every opportunity that offered of incorporating it into his scheme. Supposing he had not merely the laying-out of the site of a garden, but also the choice of its position, he should not choose a lofty hill with a panoramic view. From the result of his experience he was certain that this was a mistake: foreground and middle and distance was wanted—human interest.

Avenues of trees bordering a long stretch of water, as seen at Fontainebleau and Hampton Court, pleased him more than the terraces and beds of Versailles. One could not dissever oneself from one's climate; and though he vastly admired the superb cypress, ilex and arbutus groves of Italy, he was as fond of our deciduous trees, even in winter. He did not care very much for the appearance of evergreens in England except the yew and holly: their foliage had a hard metallic look that seemed to indicate that they were not happy in their surroundings.

To his mind the detail, invented and perfected in this country, of terrace walks, balustrades, &c., was preferable to that of any other country. Further, he would avoid marble, as looking too white and staring. A very fair surface could be got in cement (concrete) provided too much sand and water was not used and that it was not rammed down too well; otherwise the sand and cement would come to the surface and show the lines of the plank strutting. Dwarf walls of brick laid dry assumed an appearance of age very rapidly.

The author's conclusion was that we had nothing to learn now from foreign examples, that we had enough in this country to guide us, and that the best were those which were not slavish copies of other lands.

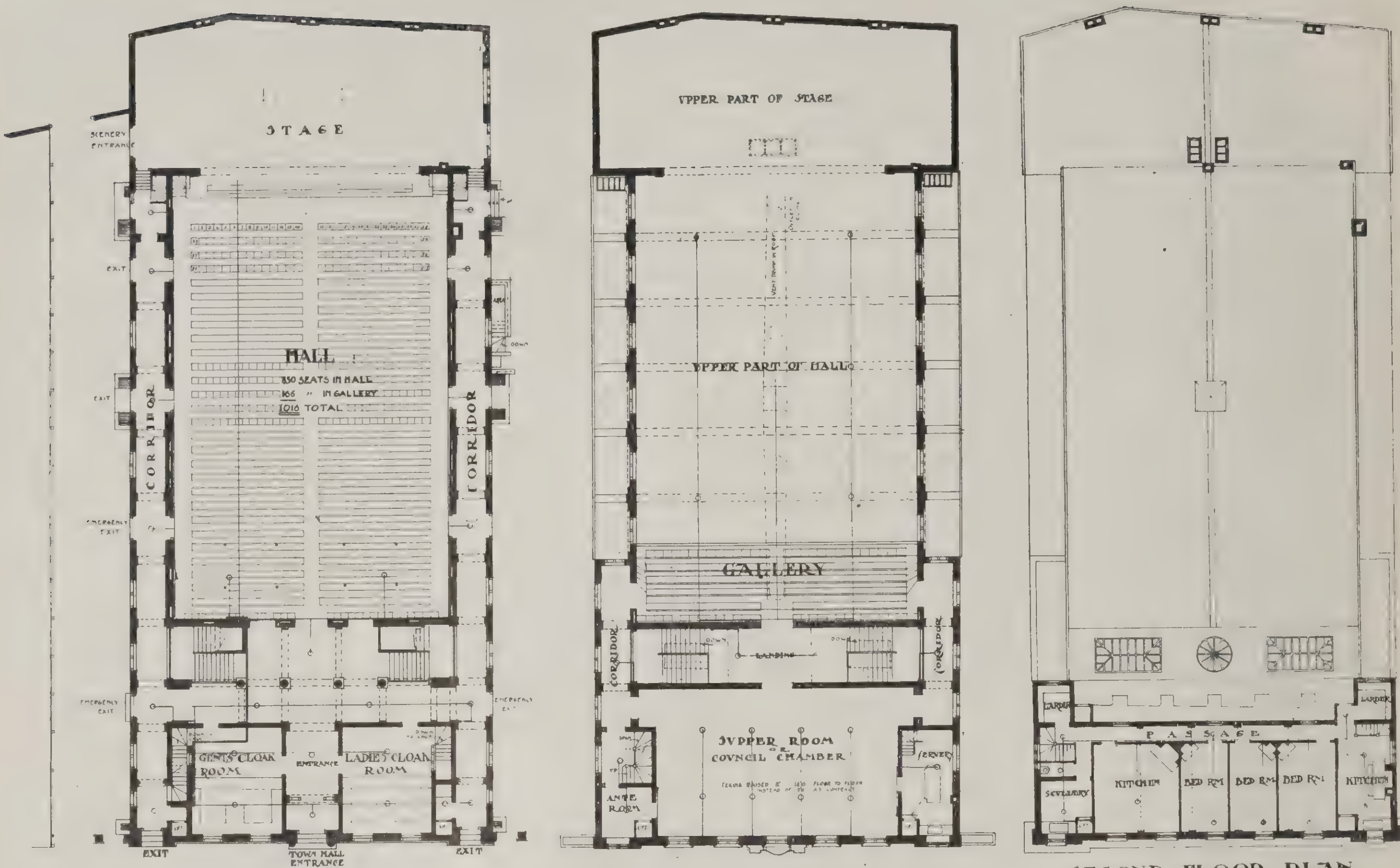
Mr. Thomas H. Mawson proposed and Lieut.-Col. Lenox Prendergast seconded a vote of thanks to Mr. Macartney. Mr. F. R. Farrow thought that the architect's work was to provide a frame in which things might grow, while Mr. Belcher emphasized the view that gardens were the architect's opportunity of linking his work to nature, to bind it beautifully to the soil and soften the hard lines.

Trade and Craft.

Mouldings.

Messrs. Elliott's Moulding and Joinery Co., Ltd., the well-known joinery manufacturers, of Newbury, have just published a catalogue of mouldings called "Architects' Series." This should be found very useful. The sections in this catalogue are characterized by their simplicity as distinct from the over-elaboration that is so distressing in mouldings used by builders and joiners. Though the variations that can be made in the shape of mouldings may be infinite, the number of mouldings that have been used is finite, and it is surprising how the forms of mouldings exactly recur in the special designs of architects; and there is no reason therefore to ban the use of stock sections, more especially as Messrs. Elliott's will generally make any required change of outline without extra charge providing the size of material is not increased. Of course the firm will make mouldings to any architect's special designs. Special attention is directed to the fact that these mouldings are struck particularly clean and sharp, saving much hand labour in cleaning up, as is usual with machine made mouldings. Goods may be primed or polished at an additional cost before leaving the works. All the drawings of sections in the catalogue are full size, and the mouldings are executed in any kind of wood. We have noticed that very few large coves are stocked by moulding manufacturers, especially in hardwoods such as oak, and this is to be regretted because of their refined impressiveness. They need not be confined to cornices. We are glad to say that Messrs. Elliott repair the deficiency to a great extent, and sections of large coves will be found in their catalogues No. 7 and No. 9, first published a few years ago. We may mention that this firm has a high reputation among architects for high-class joinery of all kinds.

Liverpool Housing.—In a paper which he read before a provincial sessional meeting of the Royal Sanitary Institute held at Liverpool on Saturday last, Mr. Fletcher T. Turton, F.S.I., deputy-surveyor to the Corporation, said that in 1864 there were 22,000 houses in Liverpool structurally insanitary, and now there were 8,600. In the Hornby Street area the Corporation was erecting 23 blocks or 445 dwellings, estimated to accommodate 2,476 persons. The total cost of the scheme would be £150,000.



GROVND PLAN. FIRST FLOOR PLAN. SECOND FLOOR PLAN

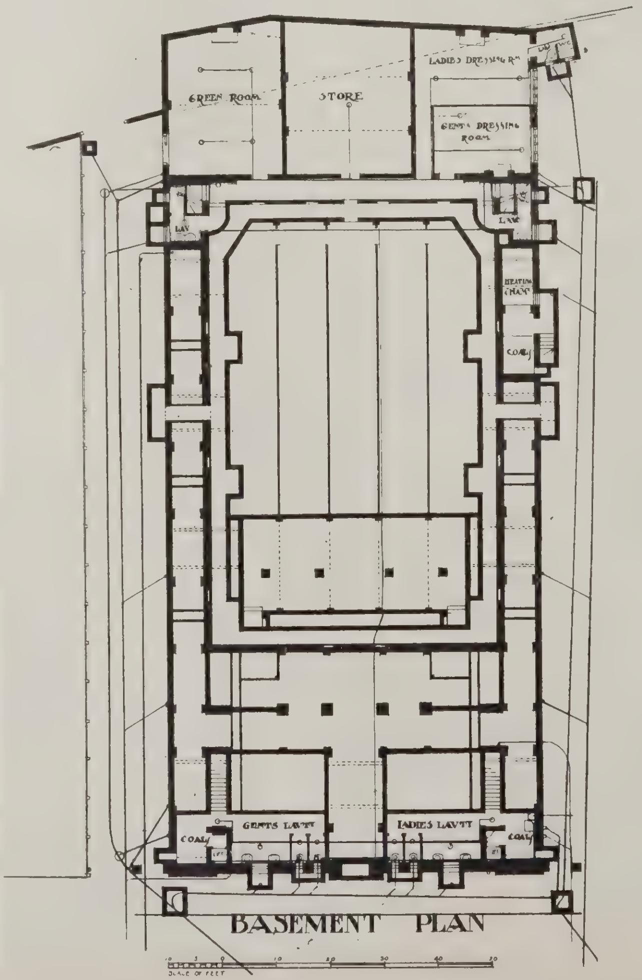
HIGH WYCOMBE TOWN HALL. BATEMAN AND BATEMAN AND ALFRED HALE, JOINT ARCHITECTS.

Builders' Notes.

Dublin Building Trade Dispute.—There is nothing new to record in reference to the building trade dispute at Dublin. Work on the various sites remains suspended.

Nottingham Building Trade Inactive.—It is nearly twenty years since the building trade of Nottingham and district experienced inactivity such as prevails at the present time. Usually the month of April has been one of the busiest of the year, but such is not the case this year. There are more than 500 trade-unionist bricklayers and joiners out of work in the city, in addition to labourers. Plumbers are also passing through a period of depression, and at the present time there is little prospect of any improvement of trade.

Reinforced Concrete Sewage Tanks.—At the new sewage works just completed for Chester an extensive use has been made of reinforced concrete, says the "Times" in its engineering supplement for Wednesday last. Difficulties with the foundations for the tanks and filters owing to the subsoil being unsuitable led to the adoption of this material, and Major Hector Tullock, C.B., R.E., the engineer, has constructed a very notable work. The precipitation tanks, of which there are twelve in number, are built on a reinforced concrete raft 200ft. long, 180ft. wide, 21ins. thick, and extending 6ft. beyond the walls of the tanks all round; the raft being laid directly on the sand, the soil only being removed. There are ten high-level and ten low-level filters, all 50ft. in diameter internally and arranged in four parallel rows. These also are all of reinforced concrete, supported by seventy-six brick columns to each filter. There is, of course, a tremendous weight on the foundation rafts from all this material, but up to the present no signs of settlement are visible.



BASEMENT PLAN

OUR PLATES.

HIGH Wycombe Town Hall was opened in October last and forms a part only of a larger scheme for providing new municipal offices which are to be erected on the adjoining land towards the right-hand side. The design for the whole was selected by Mr. T. E. Collcutt in open competition. The front of the building has been faced with Lawrence's Bracknell bricks, with Princes Risborough bricks for the sides. Portland stone has been used externally, and Hopton Wood internally for the staircases, columns and pavings. The front roof is covered with Mr. Goodwin's Colley Weston stone slates. Messrs. C. H. Hunt & Son, of High Wycombe, were the general contractors, and Mr. Fishburn was the clerk of works. Messrs. Haden & Son have executed the heating and ventilating, Messrs. Higgins & Griffiths the wiring for the electric light, and Mr. Fletcher, of Birmingham, the fittings. The cost of the present work has been about £12,000. Messrs. Bateman & Bateman and Alfred Hale, of Birmingham, are the joint architects. Lord Carrington has given a piece of land opposite as a public garden to improve the appearance of the building. It is worth noting that the large organ formerly in St. James's Hall, Piccadilly — which is now being demolished — was

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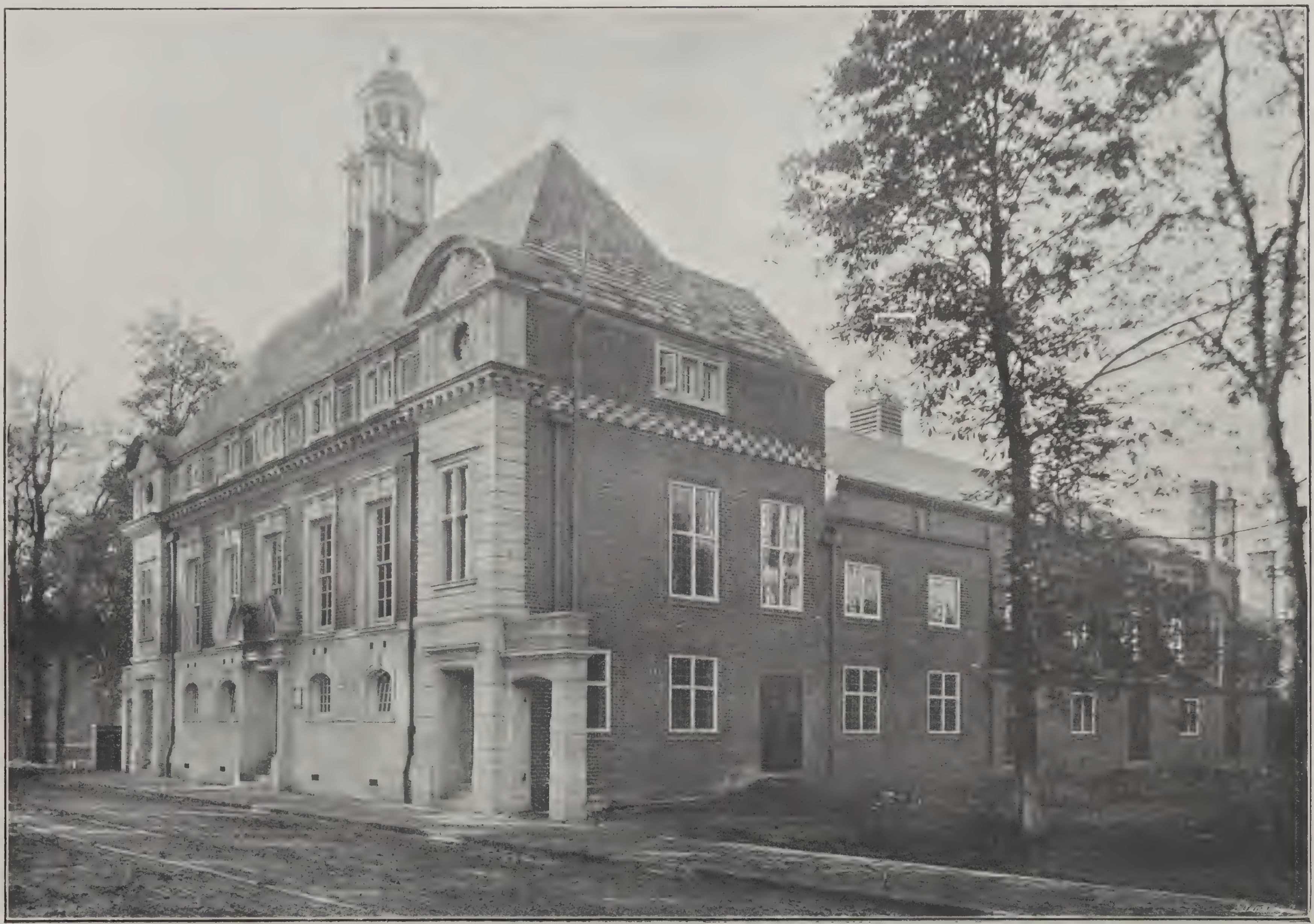
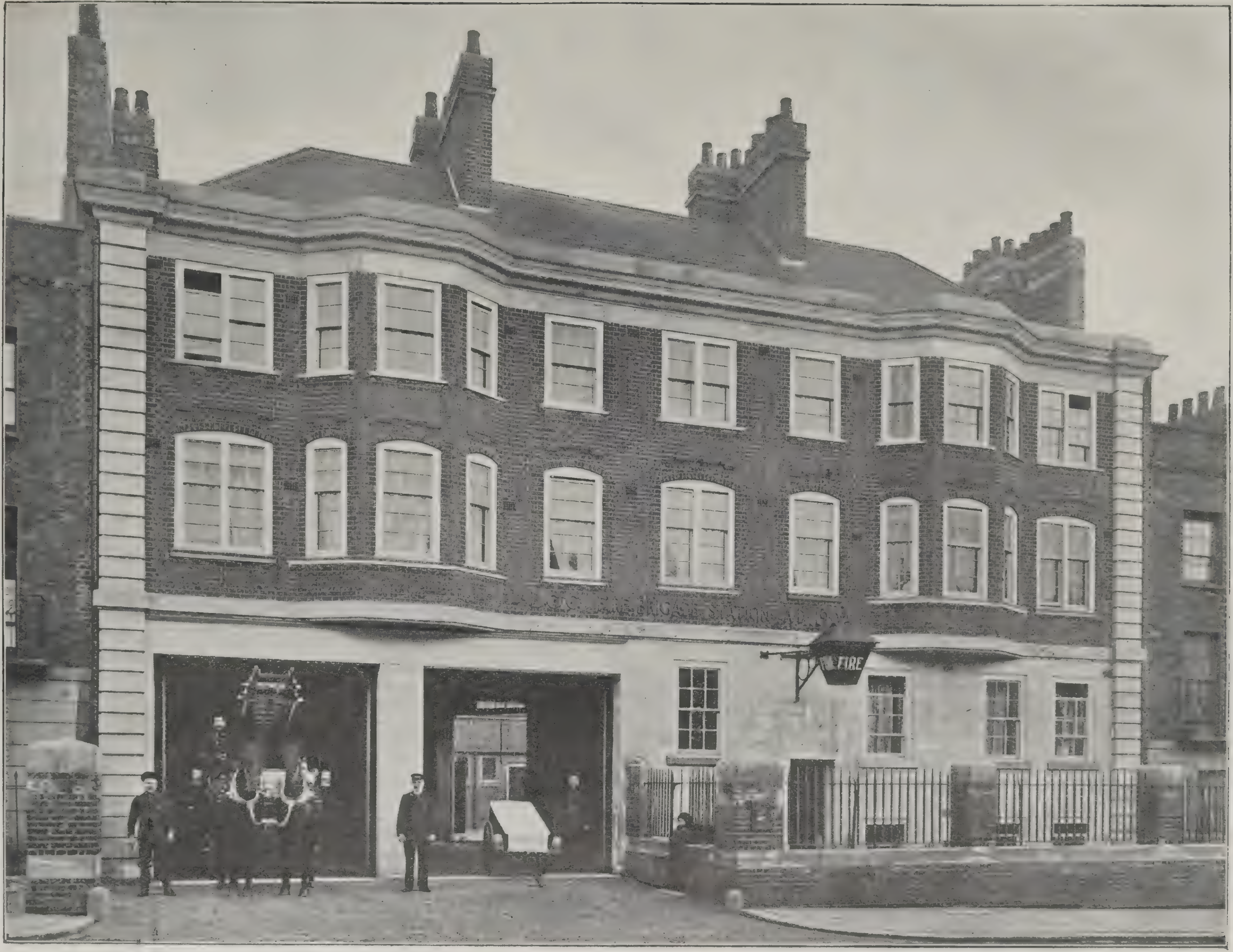
Supplement to
The Builders' Journal and Architectural Record,
Wednesday, April 19th, 1905.



High Wycombe Town Hall. C. E. Bateman and M. A. Hale, Architects.



LONDON COUNTY COUNCIL FIRE-BRIGADE STATION, PICKERING PLACE, BAYSWATER. W. E. RILEY, F.R.I.B.A., SUPERINTENDING ARCHITECT.

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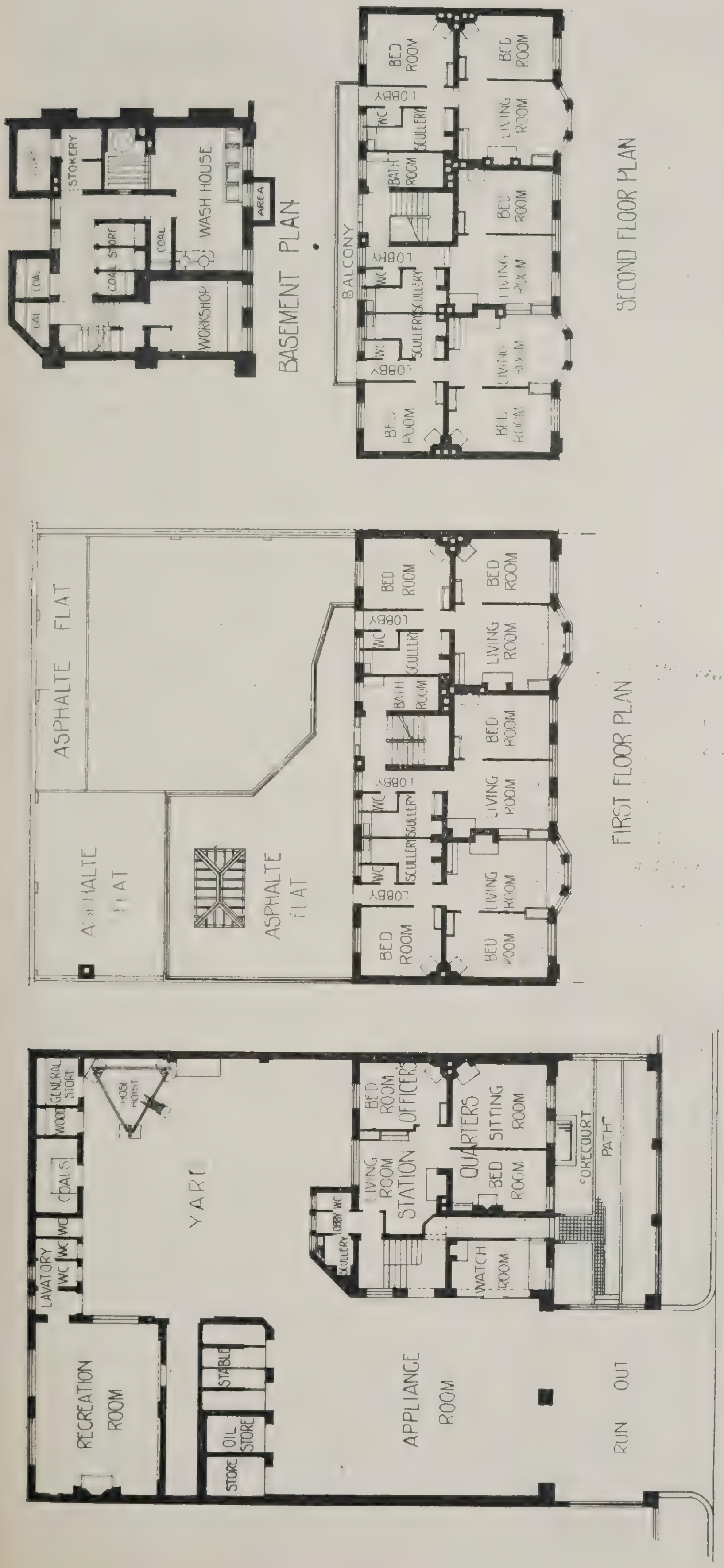
purchased by the mayor of High Wycombe for 190 guineas and is being reconstructed in the new town hall.—The London County Council fire-brigade station at Pickering Place, Bayswater, was completed towards the end of last year. It is what is called a "sub-station," having accommodation for seven men and their families and stabling for two horses (with provision for an extension). In the appliance room there is one horsed fire-escape, but space is provided also for a steamer. The front of the station has a Portland-stone base, with red Hedingham bricks above, and stone cornice. All woodwork is painted white, with the exception of the large folding doors, which are red. The roof is slated. The work was designed by and carried out under the direction of the architectural staff of the Fire-brigade Department of the Council, Mr. W. E. Riley being the superintending architect.



LONDON COUNTY COUNCIL FIRE-BRIGADE STATION, PICKERING PLACE, BAYSWATER. W. E. RILEY, F.R.I.B.A., SUPERINTENDING ARCHITECT.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Perpendicular Churches.

Referring to the enquiry and reply on Perpendicular work at or near a seaside resort in the north of England (see p. 177 of our issue for April 5th), Mr. Allen Foxley writes: "Querist should try Bridlington, where the west part of the priory church is a fine example; and at Flamborough, a few miles off, is a fine little roof-screen of that period with detail of a beauty and delicacy unusual in the North."

Mr. Herbert E. Illingworth, A.R.I.B.A., writes: "If your correspondent would go as far north as the lake district, I think he would find what he requires. He might advantageously stay at Grange or Arnside. The former place has little in the way of amusements and the latter absolutely nothing, but this is more than counterbalanced by the charming scenery and beautiful excursions which may be made. Cartmel Priory, about a mile from Grange, contains all styles from Transition Norman, and a large amount of Perpendicular work, including a really magnificent east window and fine choir stalls of somewhat Flemish character. Kendal, within easy cycling distance or rail of either place, and also of Windermere, has a very large double-aisled parish church entirely Perpendicular, though rather plain as a whole; it is, however, a very good example of the type and contains several good wood screens. Furness Abbey is also within easy reach, for which your correspondent can easily obtain fuller information from any guide-book. Lancaster Church also contains good work. I feel sure plenty of suitable subjects could be selected from this list."

Charges and Measurements.

MUSWELL HILL.—A. J. H. writes: "(1) Is it customary to add to the value of a party-wall architectural charges and quantities, which would be assuming they were originally paid in the total cost of the building? (2) Is a stonemason entitled to charge where he has undertaken to supply and fix for cutting in order to fit the ironwork? (3) In plastering to circular columns is it not sufficient to take the surface to be covered, and not the outside diameter when finished?"

(1) Yes. (2) No. (3) It would be customary to measure the outside diameter when finished. W. E. D.

Alterations in Contract.

X. writes: "I have been building a house. In the specifications the architect specified the brick walls to be done with three courses of stretchers and one course of headers, but as soon as the work began he altered the work to Flemish bond, namely, one header and one stretcher alternately, which I find causes more labour to keep the joints right. As the job is a very thin one, can I claim compensation? Again, on his drawing the architect showed walls of the same width from top to bottom—hollow, 4½ outside and 4½ inside, tied with iron ties, which would make 11ins. Now, however, he has a 14in. wall at the bottom up to the plinth about 3ft. from the ground, and a plinth course all round the building, which is not shown on plan or mentioned in the specifications. Also, he specified plain red tiles. These, however, did not suit him; he must have dun-coloured tiles costing 10s. more per 1,000. Can I claim compensation for these alterations?"

Yes, if the facts are as stated you are clearly entitled to extras for these alterations.

Lead Gutters.

REDHILL.—ENQUIRY writes: "How are lead gutters laid on a concrete roof where there are numerous valleys and flats, the roof itself being a steep pitch? The roof is to be covered with slates on battens nailed to the concrete."

The gutters should be shaped in concrete and covered with lead. It is inadvisable to use wood, as it would be liable to decay, in the absence of proper ventilation.

Rights of Rural District Councils.

TONDU.—PUZZLED writes: "I propose to erect a slaughter-house at the rear of some houses and on the bank of a small brook. The only approach to the building will be by means of a right of way 3ft. 6ins. wide between the ends of the rows of houses, or by going a long circuit and then crossing waste ground and going through the brook. The rural district council has disapproved the plans because of the unsuitable site, as by being on the bank of the brook it was thought that I might use it as a sewer, and also because of the narrow approach. Do you think they are acting strictly within their rights?"

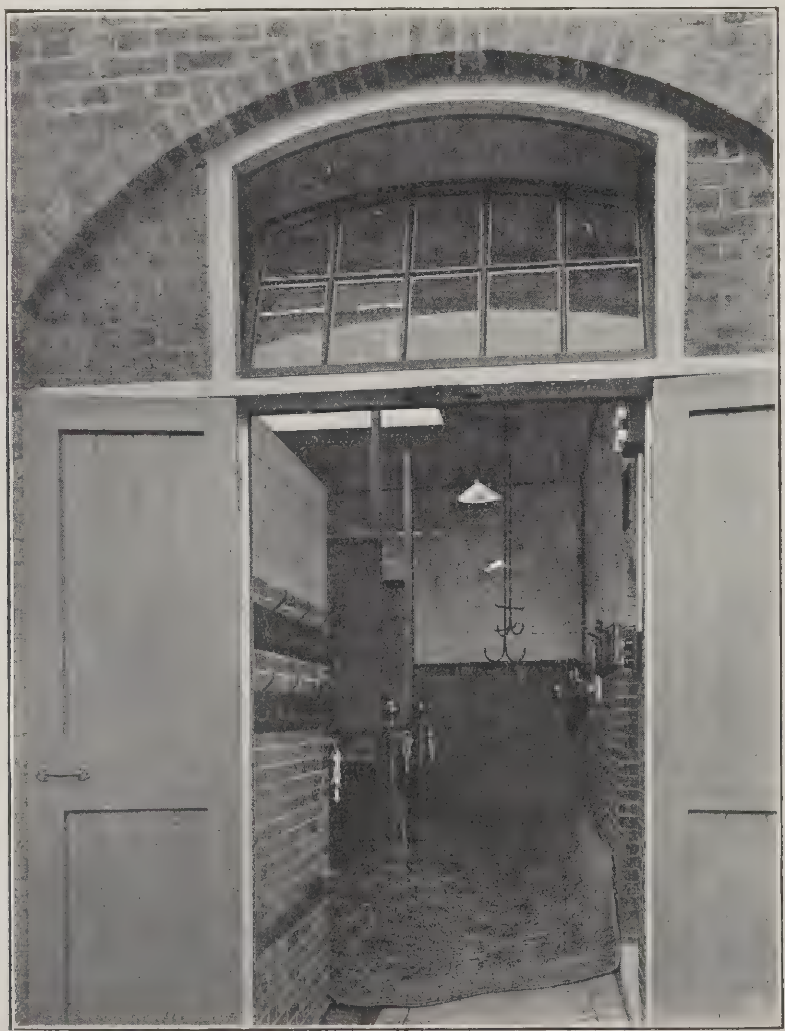
We do not think the council are acting reasonably to assume you would foul the brook. Their remedy in such a case would be to proceed against you. The precautions they should take are to see that you make adequate provision for drainage to the main sewer and that you fence off the brook. We do think the approach is too narrow, however, as shown on your sketch (not reproduced). It ought to be wide enough for a cart.

HIGH WYCOMBE TOWN HALL.

Secondary Schools.

BRIDPORT.—H. P. D. C. writes: "Please recommend a good up-to-date book on the planning, construction and design of secondary schools, containing full details."

"Modern School Buildings," by Felix Clay (price 25s. post free from our offices).



STABLES, LONDON COUNTY COUNCIL FIRE-BRIGADE STATION, PICKERING PLACE, BAYSWATER.

Acoustics.

GREAT MALVERN.—A. T. G. writes: "What book gives certain investigations on the acoustic properties of buildings (referred to by you recently), and where can a copy of the paper be obtained?"

"Specification No. 8," published annually, price 2s. 6d., or 3s. 3d. post free from our offices.

Roll-up Iron Shutters.

HAYES.—J. H. writes: "Do roll-up iron shutters make satisfactory fire-resisting doors? I have in mind one 12ft. by 8ft. Hinged plate doors would be heavy and much in the way when open."

It is inadvisable to use any doors which have not been put to very severe fire tests. The danger with roller shutters is that the metal sheets may expand under heat and bind and warp so as to let fire through. A form specially designed to overcome this is shown on p. 40 of our third "Fire Supplement," published in our issue for January 18th last. But why not use one of the sliding doors which have passed severe tests and are easy to move? It seems to us that these are the best solution of the difficulty.

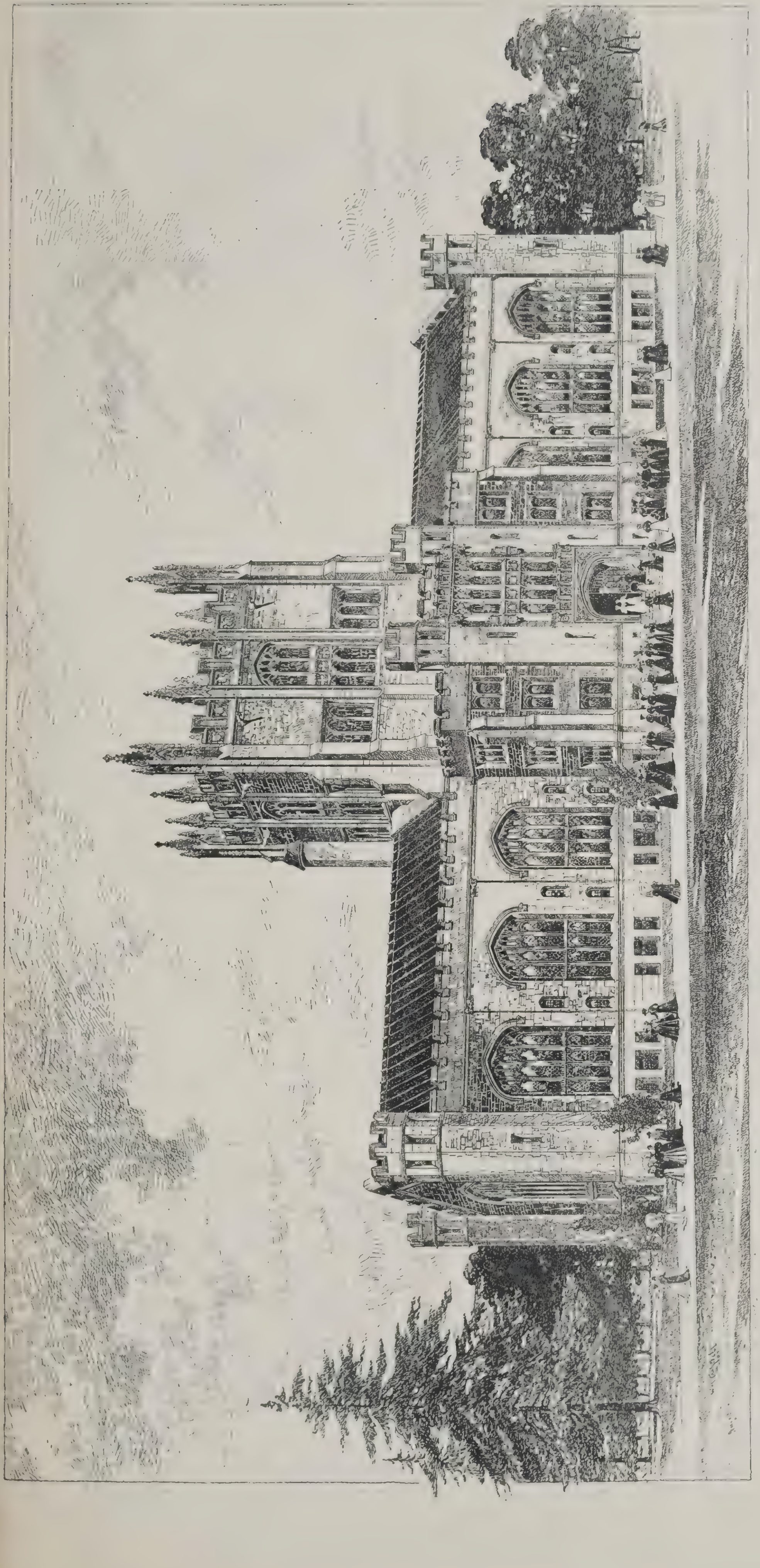
Floor Pugging.

EDINBURGH.—DEAFENED writes: "What are the advantages or disadvantages of the ordinary pugging for floors (3ins. of coarse stuff on boards and fillets) as against the best inodorous felt made for deafening purposes? If it were decided to use felt, where would be the correct place to put it—over or under the bearing timbers of floors?"

Ordinary pugging is not a very efficient deadener of sound; it is messy, especially where repairs have to be executed, and it is not sufficiently fire-resisting. The last-mentioned objection is important and forbids the use of ordinary felt. The best thing to use is slag-wool pugging. As to the place to put felt, if used, for convenience it is usually put over the heavy timbers of floors, but below would slightly improve the deadening effect.

Milburn House, Newcastle.—Messrs. Oliver, Leeson & Wood write stating that Messrs. Marshall & Tweedy, of Newcastle-on-Tyne, are joint architects with them for this building, illustrated in our issue for last week.

Building Trades' Exhibition.—In our issue for next week we shall publish an illustrated account of the chief exhibits at the Building Trades' Exhibition, which is to be held at the Royal Agricultural Hall, Islington, from April 27th to May 6th.



THOMPSON MEMORIAL LIBRARY, VASSAR COLLEGE, POUGHKEEPSIE, N.Y. FRANCIS R. ALLEN AND CHARLES COLLINS, ARCHITECTS.

Correspondence.

Mr. Bodley's Work at York Minster.

To the Editor of The Builders' Journal.

Sir,—An announcement has lately appeared of a proposal to add, under Mr. Bodley's care, flying buttresses to the nave of York Minster and to crown the buttresses on the north aisle with pinnacles similar to those existing on the south side.

The significance of this seems to have escaped the architectural press; a vigorous letter from a York freeman in one of your contemporaries is the only protest I have seen. It is not fitting that the task should be left to a layman while the profession is silent, and I trust you may see your way toward giving your valuable aid in laying the case before the profession and the public.

For many years past every succeeding visit to the Minster has been rendered more painful than the last by the sight of a leprosy of new stonework spreading from end to end of the building.

It may be reluctantly admitted that much at any rate of this process has been justified by the state of the old work, but this last proposal is of quite a different nature and belongs to a type of restoration so-called which one hoped had died an ignominious death a generation ago.

As is well known, the builders of the nave of York Minster abandoned the idea of the stone vault originally contemplated and erected instead a wooden one with little thrust on the clearstory walls; flying buttresses were thus rendered unnecessary, and though prepared for they were not built.

Huge pinnacles, very elaborate in design, had however been placed on the south aisle buttresses to provide for the thrust of the stone vault, and these were left standing; while on the north side, which was less advanced, the buttresses were finished simply at the level of the aisle parapet.

It will be seen that the present proposal involves adding to the Minster features which not only never existed but were deliberately rejected by the original builders for sound constructive reasons—reasons as cogent now as then.

I need not enlarge on the disfigurement which these immense masses of raw stonework will cause to what is now the most beautiful and satisfying portion of the exterior of the Minster.

The principle involved is of vital importance. If Mr. Bodley is to be encouraged to embellish the work of the mediæval master-builders, where is the thing to stop?

Most tempting seats exist for a pair of staring turrets on the exquisite front of the north transept; while who knows that some misguided benefactor may not provide funds for the addition of pinnacles to the central tower and so destroy its character for ever?

Has not this, too, a strong bearing on that "dignity of the profession" of which we hear so much? The barbarisms of past generations of restorers are a heavy enough weight to bear in the face of the world; and as by repentance and good works we look to win back the confidence of the public, it is a crushing blow to find the doyen of church architects working havoc on one of our grandest buildings with never a word of protest from his brethren. One is at times tempted to ask whether the popular conception of the architect is not justified more than we dare to think.

I hope I may be forgiven for writing with some heat: but, born almost within sight of York Minster, I have loved it from my youth up, and I cannot see this outrage perpetrated without raising my voice in the hope that I may move some less obscure advocate to press the matter home before irreparable damage has been wrought.—Yours truly,

London, S.W. ALLEN FOXLEY.

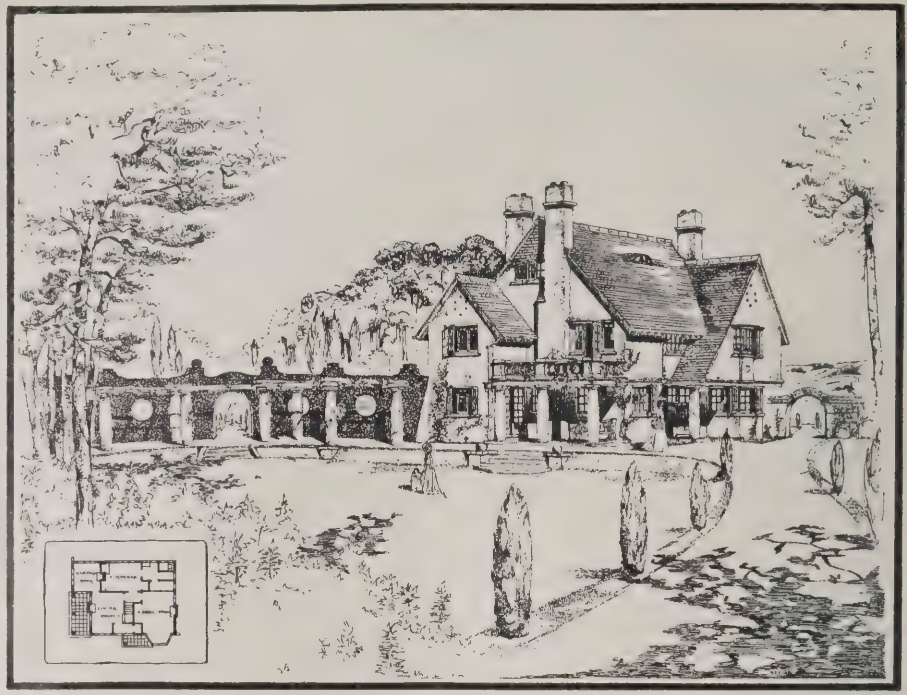
Architects and Public Works.

To the Editor of THE BUILDERS' JOURNAL.

LONDON.

SIR,—In the article under this head in your issue for last week in quoting from the "Times" you mention Bradford, Hull, Nottingham, Dublin, Aberdeen, Leith and Dundee as being the only cities with the post of city architect. To take only one example, you omit to mention Edinburgh, which certainly has a city architect, and a very capable one, in the person of Mr. Morham. As regards Dundee, the post of city architect has been extinct for the last year or so since the death of the late Mr. Alexander. As your article is certainly misleading, perhaps you will be able to explain how this mistake has arisen.—Yours truly, "AULD REEKIE."

[The article was not ours, but extracted from the "Times," as stated; and we cannot be responsible for the omissions of our contemporary. Our main reason in quoting from it was to show that the "Times" supported the Institute in the matter.—ED. B. J.]



DESIGN FOR A GARDEN HOUSE BY H. C. CONSTANTINE.

This house is treated externally with buff-tinted rough-cast and the roofs covered with purple Broseley tiles. The upper floors comprise six bedrooms, bathroom, &c. Two of the six bedrooms are in the roof. The principal features are the spacious verandah and balcony over.

Registration: The R.I.B.A. Council Election and the Society of Architects.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Having received an intimation that I have been nominated upon the House List as an Associate Member of the R.I.B.A. Council for next year, it seems to me right that I should take an early opportunity of explaining the policy which I intend to promote in the event of election.

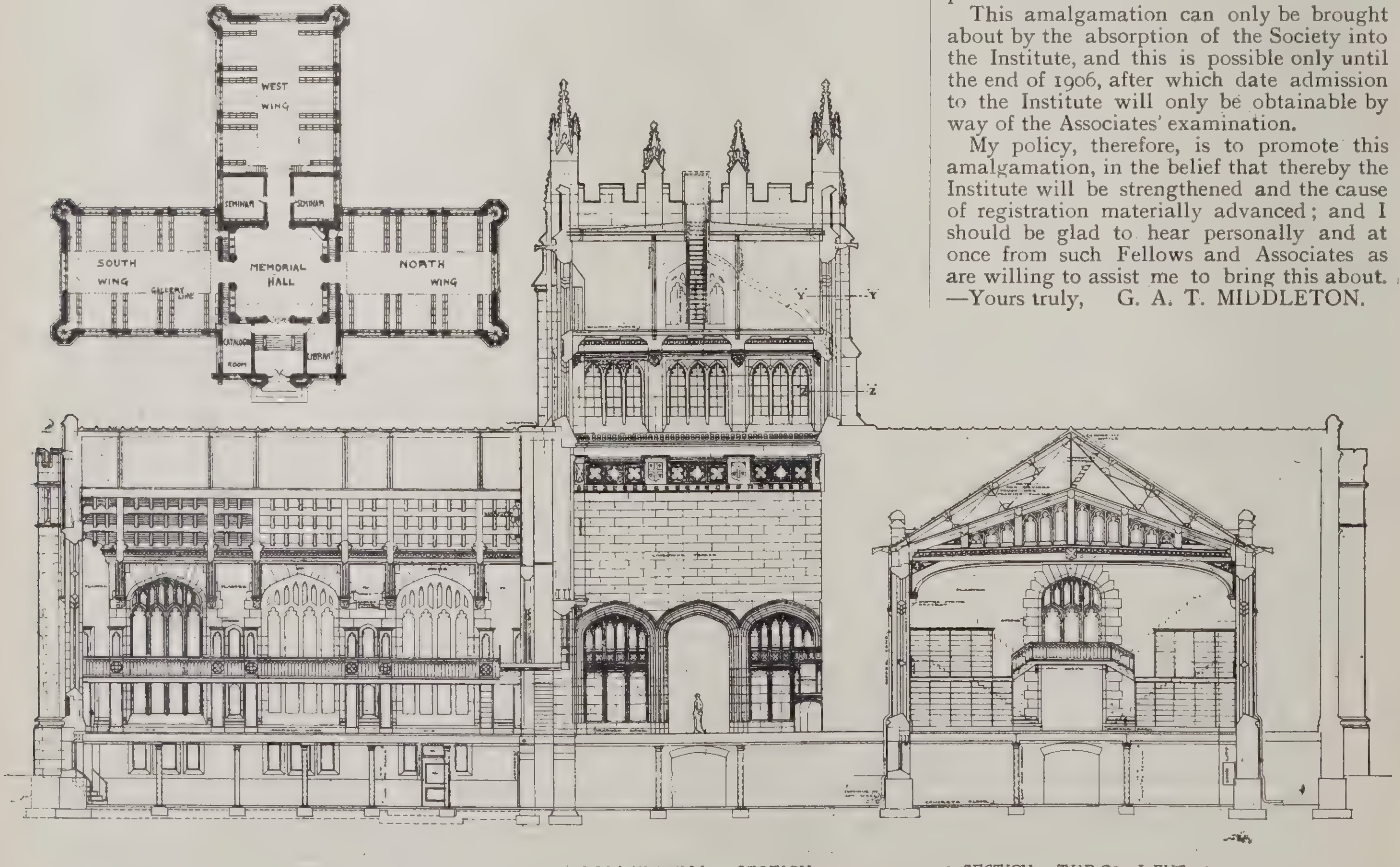
It is, I think, an open secret that the large committee which was formed early in 1904 to consider and report upon the principle of registration has prepared a new Registration Bill, or, as it is called, an "Enrolment" Bill, to lay before Parliament, and that this is a weak copy of the existing Registration Bill, so badly drawn as to be unworkable in practice and containing clauses which could on no account be accepted by the House of Commons.

For the Institute to produce so ill-considered a measure would, in my opinion, be not only grievously harmful to its great reputation, but would actually retard registration, unless, indeed, Parliament, with two Bills to select from, and seeing that the whole profession was in earnest on the matter, chose and passed the better, which is not that of the R.I.B.A.

The position is a curious and not very edifying one, but it is not beyond repair at the present moment. That a profession which is united in principle should prepare two Bills with the same object is anomalous, and seems to be due almost entirely to the separate existence of the Institute and of the Society, to both of which bodies I belong. If their amalgamation could be effected, the best points of both Bills could be welded into one perfect whole.

This amalgamation can only be brought about by the absorption of the Society into the Institute, and this is possible only until the end of 1906, after which date admission to the Institute will only be obtainable by way of the Associates' examination.

My policy, therefore, is to promote this amalgamation, in the belief that thereby the Institute will be strengthened and the cause of registration materially advanced; and I should be glad to hear personally and at once from such Fellows and Associates as are willing to assist me to bring this about.—Yours truly, G. A. T. MIDDLETON.



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Current Market Prices

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0	1	3	0
Clover, best	per load	3	15	0	4	2	6
Hay, good	do.	3	10	0	3	15	0
Sainfoin mixture ...	do.	3	10	0	3	17	6
Straw	do.	1	12	0	2	[illegible]	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ...	per cwt.	1	0	5		—	
Colza Oil, English ...	do.	1	2	3		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0		—	
Linseed Oil, barrels ...	per cwt.	0	17	1⅓		—	
Petroleum, American ...	per gal.	0	0	5⅛		—	
Do. Russian ...	do.	0	0	4⅜		—	
Pitch	per barrel	0	8	0		—	
Shellac, orange	per cwt.	7	10	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	4	0		—	
Tar, Stockholm	per barrel	1	6	6		—	
Turpentine	per cwt.	2	4	0		—	

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ...	per ton	82	0	0		—	
Iron, Staffs., bar ...	do.	5	17	6	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	5	0		—	
Lead, pig. Soft Foreign...	do.	12	13	9		—	
Do. do. English common brands	do.	12	18	9		—	
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14	0	0		—	
Do. pipe	do.	15	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	5	0		—	
Do. floor brads... ...	do.	9	0	0		—	
Steel, Staffs., Girders and Angles	do.	5	5	0	6	0	0
Do. do. Mild bars ...	do.	6	0	0	6	5	0
Tin, Foreign	do.	141	10	0	142	0	0
Do. English ingots ...	do.	137	10	0	139	0	0
Zinc, sheets, Silesian ...	do.	28	0	0		—	
Do. do. Vielle Montaigne	do.	29	0	0		—	
Do. Spelter	do.	23	10	0	23	16	3

TIMBER.

Soft Woods.

		£	s.	d.	£	s.	d.
Whitewood, American, logs.	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	3	0
Fir, Dantzic and Memel	per load	2	7	6	4	15	0
Pine, Quebec, Yellow ...	do.	4	5	0	7	5	0
Do. Pitch, American	do.	2	8	0	5	15	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, Nederkalix, Yellow, 1st, 4×10	per std.	10	15	0	11	0	0
Do. Archangel, Yellow, 2nd, 3×9	do.	14	10	0		—	
Do. do. do. 4th, 3×11	do.	7	15	0			
Do. do. do. do. 3×9	do.	8	15	0		—	
Do. do. White, 2nd, 3×11	do.	10	5	0		—	
Do. Umba, Yellow, 3rd, 3×11	do.	9	0	0		—	
Do. Kem (White Sea), Yellow, 3rd, 3×9	do.	11	5	0		—	
Do. Petersburg, Yellow, 1st, 3×9	do.	11	5	0	13	15	0
Do. do. do. Unsorted, 3×9	do.	10	5	0		—	
Do. do. White, 1st, 3×9	do.	9	10	0		—	
Do. Kovda, Yellow, 3rd, 3×9	do.	10	15	0		—	
Do. Kemi, Yellow, 1st and 2nd, 3×9	do.	10	15	0	11	0	0
Do. Skelleftea Yellow, 3rd, 2½×8	do.	8	10	0		—	

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

During the week ending April 14th twenty-five failures in the building and timber trades in England and Wales were gazetted.

G. R. Rackham, contractor, Norwich. R.O. April 6th.

J. Woodgate, builder, Eastbourne. R.O. April 5th.

G. B. Thurley, builder, Old Fletton. R.O. April 7th.

W. Dowland, builder and contractor, Sutton. R.O April 4th.

A. Lyons, builder and contractor, Malton. R.O. April 6th.

J. Morley, plumber and electrician, Hull. R.O. April 5th.

C. Rook, builder and contractor, Cardiff. R.O. April 6th.

J. Marshall, builder, King's Heath. Liabilities £1,010; assets £75.

E. Harlow, builder and carpenter, Chatham. R.O. April 7th.

Tatton & Fitzgerald, timber merchants, Ashton-on-Mersey. R.O. April 7th.

T. Whitney, builder and contractor, Manchester. P.E., Manchester C.C., May 15th, at 10.

F. Hunt & Co., slating and tiling contractors and builders' merchant, Southend-on-Sea. R.O. April 3rd.

W. E. Wilkins, carpenter and builder, Bristol. Adj. April 6th.

T. W. Richards, joiner and builder, Tibshelf. R.O. February 27th.

Boughey & Topping, builders, New Brighton. R.O. April 3rd.

T. Chatwin, builder, Notting Hill. R.O. April 4th. P.E., London Bankruptcy Court, May 17th, at 11.30.

T. H. Hayes & Co., builders, East Sheen. Adj. April 3rd.

J. Brooks, monumental mason, Smethwick. First meeting, 191, Corporation Street, Birmingham, April 29th, at 12. P.E., West Bromwich C.C., May 5th, at 10.30.

J. F. Carrington, painter and decorator, Leeds. R.O. April 4th. First meeting, O.R.'s, Leeds, April 19th, at 11. P.E., Leeds C.C., May 15th, at 11.

H. Crookes, builder, Sheffield. First meeting, O.R.'s, Sheffield, April 19th, at 12. P.E., Sheffield C.C., April 27th, at 2.

F. W. Matthews, house decorator, Dartmouth. First meeting, O.R.'s, Plymouth, April 19th, at 11. P.E., East Stonehouse Town Hall, same day, at 12.

W. Huggins, builder, Leyton. First meeting, London Bankruptcy Court, April 27th, at 12. P.E., same, May 18th, at 11.

F. E. Cullimore, builder and contractor, Ashford. First meeting, 24, Railway Approach, London Bridge, April 19th, at 11.30. P.E., Kingston C.C., May 9th, at 2.30.

Clark & Roberts, carpenters and builders, Shrewsbury. R.O. April 5th. First meeting, O.R.'s, Shrewsbury, April 29th, at 11. P.E., Shrewsbury Shire Hall, May 9th, at 11.

Coming Events.

Wednesday, April 19.

Royal Sanitary Institute. — Inspection and Demonstration at Harrison & Barber's Knacker Yard, Winthrop Street, Whitechapel, E., at 3 p.m.

Institute of Sanitary Engineers.—Examination and Literary Committee at 3.30 p.m. Finance Committee at 5 p.m. Special Council Meeting at 6 p.m. Sessional Meeting at 7 p.m. Paper by Mr. E. R. Palmer on "The Ventilating, Flushing and Cleansing of Sewers and Drains."

Chemical Society.—Meeting at Burlington House at 5.30 p.m.

Builders' Foremen and Clerks of Works' Institution.—Meeting at 8 p.m.

April 21-25.

Architectural Association (Camera and Cycling Club).—Easter Excursion to Hereford.

Saturday, April 22.

Edinburgh Architectural Association.—Visit to Drum House, Gilmeston.

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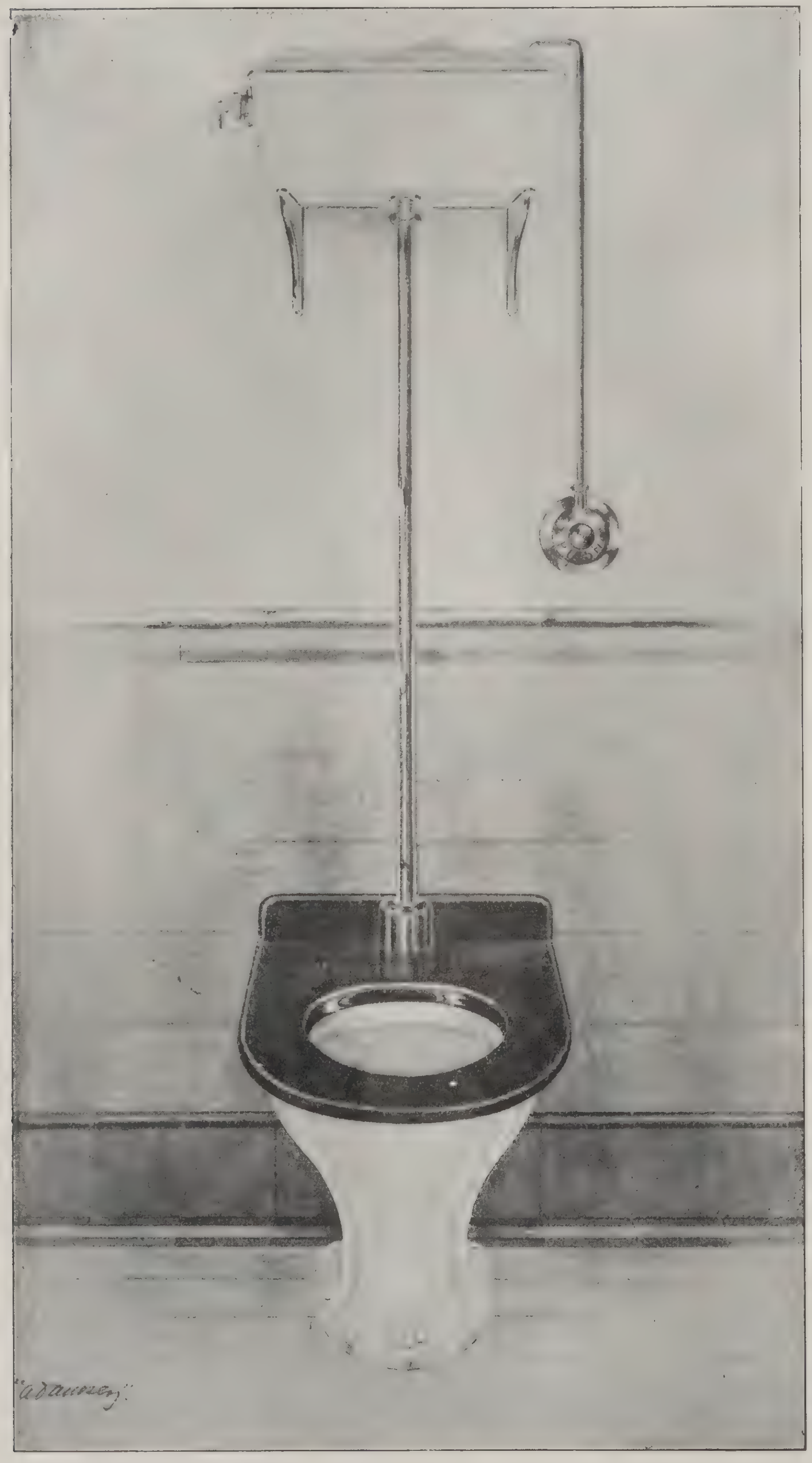

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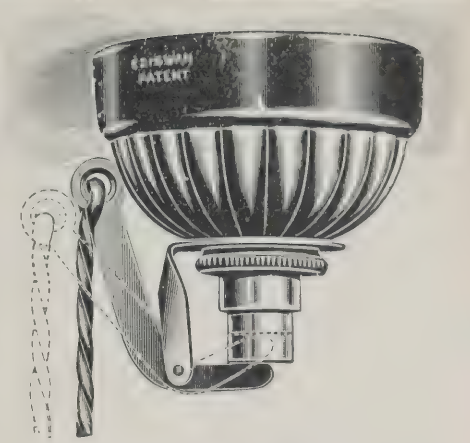
Electrical Notes.

A Power House.—The Junior Institution of Engineers recently visited the Willesden power house of the North Metropolitan Electric Power Supply Co. at Taylor's Lane, the engineer of which is Mr. E. T. Ruthven Murray. The continuous current is generated direct at a pressure of from 490 to 540 volts, suitable for the 2 by 240 volt network surrounding the works, and this fixes the average pressure of the alternating current terminals of the same generator at 316 volts; the machines being, as it were, rotary converters driven by engines. Step-up transformers with a ratio of 1 : 9 are employed, raising the pressure to an average of about 2,850 volts, at which it is transmitted to the sub-station, there variable-rate step-down transformers and rotary converters once more reduce the pressure down to that suitable for a 2 by 240-volt three-wire continuous-current distribution. The site of the station occupies an area of 3½ acres and adjoins the Midland and South Western Junction Railway, from which access can be gained to all the great northern lines. The boilers are of the Babcock-Wilcox type, arranged in pairs, built in glazed brick settings. Draught gauges are fitted and an "Ados" registering CO_2 recorder. There are Hall steam feed pumps and a Mather & Platt electrically-driven pump, the latter having a special device for effecting its regulation. The arrangement of steam mains is novel. A jet condenser by Ashton Frost & Co. is provided for the two 300-k.w. sets, while the other sets have their own surface condensers. There is a cooling plant supplied by Korting Brothers, on which are four lines of spraying jets. The surface of the pond is 30ft. by 200ft., and it is capable of dealing with 100,000 gallons of water per hour, which is the storage capacity of the pond. All water is softened by a Brunn-Lowener apparatus in which milk of lime and soda are used. For the general arrangement and for the design of many of the special details of the low-tension continuous-current switchboard Mr. Ruthven Murray was responsible. His object was to arrange a switchboard embodying the distinctive and valuable features of the Ferranti high-pressure cellular type of switch gear for low-pressure working. The principal feature of novelty in the low-tension switchboard is that four separate 'bus bars are provided, and there are "selector switches" which enable any machine or feeder to be connected to any 'bus bar. The battery room contains 250 Tudor cells with a capacity of 840 ampére hours at a 10-hours' discharge rate.



A New Switch.

We illustrate above a new "pull" type button switch introduced by the Edison and Swan Co., of 36 and 37, Queen Street, Cheapside. The example shown is for use on a ceiling. The special feature of this switch is that it has an adaptor which presses the button when the cord is pulled, and the on and off position is actuated by one cord only. Its merit is that it saves expense in installation. The cost of the fitting is 2s. 6d., or the adaptor alone, 9d.

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
April 20	Penponds, near Redruth—Vicarage	——	Vicarage, Penponds.
„ 20	Bradford—Station Buildings	Corporation	J. Watson, Waterworks Engineer, Town Hall, Bradford.
„ 20	Gloucester—Repairing Works	——	Waller & Son, Gloucester.
„ 21	Askrigg, Yorks—Hall	——	James Skidmore, Askrigg.
„ 21	Helen's Bay, Ireland—Alterations, &c., to Church	Committee of Presbyterian Church.	Hobart & Heron, Scottish Provident Building, Glasgow.
„ 22	North Shields—Converting Schools into Fire Station	Corporation	J. F. Smillie, Borough Surveyor, Tynemouth.
„ 22	Westbury, Wilts—Residence	Mr. R. E. Boulton	W. H. Stanley, Market House Chambers, Trowbridge.
„ 22	Willington, Durham—Warehouse, &c.	Co-operative Society, Ltd.	R. W. Hamilton, Secretary to Society, Willington.
„ 22	Elland, Yorks—Two Houses	Mr. J. Carter	K. Thomspon, Post-Office Chambers, Elland.
„ 22	Alnwick—Bridge Works	Rural District Council	Council Office, Fenkle Street, Alnwick.
„ 22	Llanbadarch—Alteration to Hotel	Croswell's Brewery	Evans, William & Evans, Pontypridd.
„ 22	Fenton—Altering Forecourts of Premises	Urban District Council	S. A. Goodall, Town Hall, Fenton.
„ 24	Belfast—Pump-house, &c.	Tramways and Electricity Committee.	City Surveyor's Office, Town Hall, Belfast.
„ 24	Askam-in-Furness—House	Urban District Council	Council's Building, Station Road, Dalton-in-Furness.
„ 24	Silloth, Cumberland—Alteration to Hotel	Carlisle New Brewery Co., Ltd.	G. Armstrong, 24 Bank Street, Carlisle.
„ 24	Abercynon, Wales—Chapel, &c.	Trustess of Moriah Chapel	A. Lloyd Thomas, Church Street Chambers, Pontypridd.
„ 24	Chepstow—Alterations to Schools	——	W. H. D. Caple, Church Street Chambers, Cardift.
„ 25	Abersychan—Residence	Mr. A. K. Edmonds	D. J. Lougher, Bank Chambers, Pontypool.
„ 25	London, N.—Caretaker's Lodge, &c.	Islington Borough Council	J. P. Barber, Town Hall, Upper Street, N.
„ 26	King's Norton—Library	Urban District Council	A. W. Cross, 23 Valentine Road, King's Heath.
„ 27	Gateshead—Stables	——	N. P. Pattinson, Town Hall, Gateshead.
„ 27	Keighley—Alteration to Court-house	Standing Joint Committee	J. Vickers Edwards, County Hall, Wakefield.
„ 27	Windsor—Police and Fire Station	Town Council	A. E. Stickland, Alma Road, Windsor.
„ 27	Southend-on-Sea—Library	——	W. H. Snow, Town Clerk, Southend-on-Sea.
„ 27	Belfast—Library	Technical Instruction Committee	S. C. Hunter, 2 Wellington Place, Belfast.
„ 28	Dundalk—Altering Railway Saloon	Mrs. Hanratty	J. F. M'Gahon, Roden Place, Dundalk.
„ 29	Boston, Lincs—Infirmary, &c.	Guardians	Workhouse, Boston.
„ 29	Swaffham, Norfolk—Nurses' Quarters	Guardians	L. F. Eagleton, King Street, King's Lynn.
May 1	Rochester—Technical Institute	Corporation	W. Banks, City Surveyor, Rochester.
„ 1	Macclesfield—Walls	Guardians	J. Wright, King Edward Street, Macclesfield.
„ 1	Oban, N.B.—Pier	Commissioners	D. A. Stevenson, 84 George Street, Edinburgh.
„ 1	Stockport—School	Education Committee	A. Lawton, Secretary of Education Committee, Stockport.
„ 1	Barry, South Wales—Girls' School	Education Committee	G. A. Birkenhead, Caledonian Chambers, Cardiff.
„ 2	Sheffield—Refuse Destructor	Health Committee	C. F. Wike, Town Hall, Sheffield.
„ 2	Cleethorpe—Lecture Hall and Two Classrooms	——	H. Harper, Architect, Market Place Nottingham.
	ENGINEERING:		
April 20	Bournemouth—Steel Poles, &c.	Town Council	F. W. Lacey, Municipal Offices, Bournemouth.
„ 21	Pentre, Glam—Waterworks	Urban District Council	O. Thomas, Gas and Water Offices, Pentre, Glamorganshire.
„ 22	Colwyn Bay, Wales—Steam Engine, &c.	Urban District Council	J. C. Pennington, Gas Office, Colwyn Bay.
„ 24	Colchester—Engine, Boiler, &c.	Corporation	G. E. Bland, Town Hall, Colchester.
„ 24	New Ferry, Cheshire—Electric Installation	Urban District Council	Surveyor to Council, Public Offices, Lower Babington.
„ 24	Wick, N.B.—Waterworks	Town Council	Town Hall, Wick.
„ 25	Bentham, near Settle—Water-supply Works	Rural District Council	T. A. Foxcroft, Town Hall, Settle.
„ 25	Glasgow—Heating, &c.	Corporation	Office of Public Works City Chambers, 64 Cochrane Street, Glasgow.
„ 25	Ilford—Filter Beds	Urban District Council	H. Shaw, Town Hall, Ilford.
„ 26	Whitby—Waterworks Extension	Rural District Council	W. S. Gray, 38 Flowergate, Whitby.
„ 26	Croydon—Pumping Plant	Town Council	G. F. Carter, Town Hall, Croydon.
„ 26	Stockport—Generator	Gas and Electricity Committee	A. J. H. Carter, Electricity Works, Millgate, Stockport.
„ 27	Manchester—Construction of New Curve	Cheshire Lines Committee	H. Blundell, Engineer, Central Station, Liverpool.
„ 28	Llandebie and Ammanford—Water-supply Works	Urban District Council	H. H. Brynmarlais, Ammanford.
„ 28	Rhydymwyn, Flintshire—Bridge, &c.	Holywell R.D.C.	S. Evans, County Buildings, Mold.
„ 28	Wimbledon—Electricity Plant	Urban District Council	H. Tomlinson-Lee, Electricity Works, Durnsford Road, Wimbledon.
May 1	Suakin (Red Sea)—Lighthouse	Ports and Lights Administration	Deputy-Controller-General, Ports and Lights Administration, Alexandria.
„ 1	Bristol—Electric Lifts	Docks Committee	W. W. Squire, Cumberland Basin, Bristol.
„ 2	Kanturk, Ireland—Waterworks	Rural District Council	T. Guiney, Clerk, Workhouse, Kanturk.
„ 8	Bishop's Stortford—Boilers, &c.	Urban District Council	T. Swatheridge, 7 North Street, Bishop's Stortford.
„ 30	Sydney, New South Wales—Refuse Destructor	Municipal Council	Acting Agent-General for State of New South Wales, Victoria St., S.W.
	IRON AND STEEL:		
April 20	Egremont, Cheshire—Wrought-iron Tube	Wallasey U.D.C.	Gas and Water Engineer's Office, Dock Road, Seacombe.
„ 20	Bradford—Railways and Gates	Corporation	J. H. Cox, Town Hall, Bradford.
„ 24	Glasgow—Steelwork	Caledonian Railway Co.	Company's District Engineer's Office, 16 Killermont Street, Glasgow.
„ 27	Tamworth—Fencing, &c.	Town Council	F. E. G. Bradshaw, 36 Aldgate, Tamworth.
„ 31	Manchester—Pipes	Waterworks Committee	Secretary, Waterworks Office, Town Hall, Manchester.

Complete List of Contracts Open.—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		IRON AND STEEL—*cont.*		
May	5	Christiania, Norway—Rails, &c....	Board of Trade	Offices of Commercial Intelligence Branch of Board of Trade, 73 Basinghall Street, E.C.
,,	8	Egremont, Cheshire—Iron, Steel, &c. ...	Wallasey U.D.C. ...	Manager's Office, Egremont Ferry, Cheshire.
Sept.	1	Sydney, Australia—Iron and Steel	——	Agent-General's Office, 9 Victoria Street, S.W.
		PAINTING AND PLUMBING:		
April	20	Egremont, Cheshire—Oils and Paints ...	Wallasey U.D.C. ...	Water and Gas Engineer's Office, Dock Road, Seacombe.
,,	20	Leek—Painting Work at Cemetery, &c.	Urban District Council ...	W. E. Beacham, Town Hall, Leek.
,,	22	St. David's, Pembrokeshire—Painting, &c., Chapel	——	Captain Roach, Belmont, St. David's.
,,	24	Stratford-upon-Avon—Painting, &c., at Cemetery ...	Town Council	Borough Surveyor's Office, Stratford-upon-Avon.
		ROADS AND CARTAGE:		
April	20	Oakham—Road Materials ...	Rutland C.C.	B. A. Adam, Clerk, Oakham.
,,	20	Houghton-le-Spring, Durham—Road Materials	Rural District Council ...	D. Balfour, Houghton-le-Spring.
,,	21	Tunbridge Wells—Road Materials	Tonbridge R.D.C	Frank Harris, Broadway, Southborough, Tunbridge Wells.
,,	22	Hambledon, near Guildford—Road Materials	Rural District Council ...	Surveyors to Council, Hambledon.
,,	24	Alderley Edge—Watering Roads	Urban District Council ...	H. Sheldon, Council Offices, Alderley Edge.
,,	24	Cairo—Broken Stone, &c....	——	Office of Inspector-General of Irrigation, Lower Egypt.
,,	25	Govan, N.B.—Bricks and Cement	Town Council	T. C. Parsons, Helen Street, Govan.
,,	25	Heath Town, near Wolverhampton—Paving...	Urban District Council ...	Berrington & Son, Civil Engineers, Wolverhampton.
,,	25	Perth—Road and Street Works ...	Town Council	R. M'Killop, 12 Tay Street, Perth.
,,	25	Desborough, Northants—Granite	Urban District Council ...	D. J. Diver, Desborough.
,,	25	Keighley—Paving, &c.	Corporation...	W. H. Hopkinson, Borough Engineer, Keighley.
,,	26	Hoxne, near Eye, Suffolk—Road Materials ...	Rural District Council ...	N. B. Garrard, Clerk, Hoxne, near Erye, Suffolk.
,,	26	Walsoken, near Wisbeach—Road Materials ...	Urban District Council ...	J. Kerridge, 118 Norwich Road, Walsoken.
,,	27	Luton—Street Improvement Works, &c.	Town Council	Borough Surveyor, Town Hall, Luton.
,,	30	Wantage—Road Materials...	Rural District Council	District Surveyor, East Ilsley.
May	3	Wanstead—Making-up Street	Council	Council Offices, Wanstead, N.E.
No date		Nuneaton—Street Works ...	——	Stanley Brothers, Ltd., Nuneaton.
		SANITARY:		
April	22	Durham—Disinfectants ...	Corporation...	J. P. Pegge, 60 Sadler Street, Durham.
,,	25	Epsom—Extension of Sewer	Rural District Council ...	Council Offices, Waterloo Road, Epsom.
,,	25	Haworth, Yorks—Scavenging	Urban District Council ...	J. Spencer, York Buildings, Cooke Street, Keighley.
,,	25	London, N.—Conveniences	Islington Borough Council	J. P. Barber, Town Hall, Upper Street, N.
,,	25	Rochdale—Conveniences ...	Corporation...	S. S. Platt, Town Hall, Rochdale.
,,	27	Wirral, Cheshire—Sewers, &c. ...	Rural District Council ...	F. E. Priest, 13 Harrington Street, Liverpool.
May	1	Salisbury—Sewers ...	Corporation...	Sir A. Binnie & Sons, 9 Great George Street, Westminster, S.W.
,,	2	Glasgow—Sewer ...	Corporation...	City Engineer, City Chambers, 64 Cochrane Street, Glasgow.
,,	5	Bromley, Kent—Sewers ...	Rural District Council ...	A. Williams & Sons, 14 Victoria Street, S.W.
,,	15	Kensington—Disinfection Station	Urban District Council ...	W. Weaver, Town Hall, Kensington High Street, W.
		TIMBER:		
April	24	Dublin—Sleeper Blocks ...	Great Northern Railway Co. ...	T. Morrison, Amiens Street Terminus, Dublin.

List of Competitions Open.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
April	29	Radcliffe, Lancs—Library, &c. ...	£50, £30 & £20	£1 1s.	S. Mills, Council Offices, Radcliffe, Manchester.
May	1	Ilford—Design for Adhesive Stamp for Hospital Committee.	——	£2 2s.	Wright & Sons, 31 Cranbrook Road, Ilford.
,,	24	Harrogate—Orphanage ...	——	10s.	Rev. J. T. Barkley, Riche Mont, Harrogate.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

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3 & 5, EMERALD STREET,
THEOBALD'S ROAD,
(New Address) W.C.

FANLIGHT OPENERS & GEARING.

Metal Sashes.

Panic Bolts.

Weather Bars.

Reversible Window Fittings, &c.

UNPRECEDENTED OFFER. As an advertisement, for a short time only we are giving away the 10/6 "Safety Pen" for 2/6

A great improvement upon all other Fountain Pens.

THE SAFETY PEN

Latest Improved Twin Feed.

Unequalled for its Beauty—Smoothness in Writing—Regular Feeding in Ink—Easy to Fill—Easy to Handle—Easy to Write.
Sample Pens, 2/6; Usual Retail Price, 10/6. The 21/- Pen, Handsome Gold Mounted, for 5/-
Makers: E. NEWTON & Co., 63, Aldermanbury, London, E.C.

The
BUILDERS' JOURNAL
for April 26th
will be a
SPECIAL DOUBLE NUMBER
containing a full, illustrated
account of the
BUILDING TRADES EXHIBITION,
and will be on Sale on the Opening Day
and throughout the whole of the
Exhibition at the
BUILDERS' JOURNAL STALL,
No. 56, Row C.
Price 2d. Price 2d.

BIRKBECK BANK
ESTABLISHED 1851.
Current Accounts. 2 % Interest allowed on minimum monthly balances when not drawn below £100.
Deposits. 2½ % Interest allowed on Deposit Accounts.
Advances made. *Stocks and Shares* bought and sold.
Apply Secretary,
Southampton Buildings, High Holborn, W.C.

MARBLE SHOP FITTINGS,
LANDINGS, STEPS, WALL LININGS, COUNTERS,
Lavatory Tops, Chimney Pieces, Granite Pilasters, Columns, Shop Fronts, &c.
SILVER MEDAL AWARDED.
Estimates and Designs Furnished.
Established 1850. Tel. Address: "Mullulus, London."
Telephone: No. 711, Central.
W. H. MULLIS, 48, SCRUTTON ST., CURTAIN ROAD, E.

GIBBS BROTHERS,
LOUGHBOROUGH.
Manufacturers of
Best Red Pressed and Sand Stock Facing Bricks, &c., also of Mountsorrel Concrete Paving Flags, Window Heads, Cills, &c.
SLATE MERCHANTS.
Stocks of VELINHELI and BANGOR on hand.

FOR
BLIND LATHS
GO TO
R·BELL & Co. LTD BROMLEY-BY-BOW.
Estd · LONDON · 1832

·BOOTE'S·TILES·
FOR ALL PURPOSES
WRITE FOR
NEW CATALOGUE OF FLOOR & GLAZED TILES
TO
·T & R. BOOTE LTD·
THE PATENT TILE WORKS
BURSLEM.
LONDON OFFICE BIRKBECK BANK BLDGS HOLBORN, W.C. | MANCHESTER OFFICE 49 DEANSGATE

THE BUILDERS' JOURNAL SUPPLY DEPARTMENT.

Following our settled policy of helping our subscribers in every possible way, we have inaugurated a department for the supply of drawing office requisites of a reliable nature, at low prices.

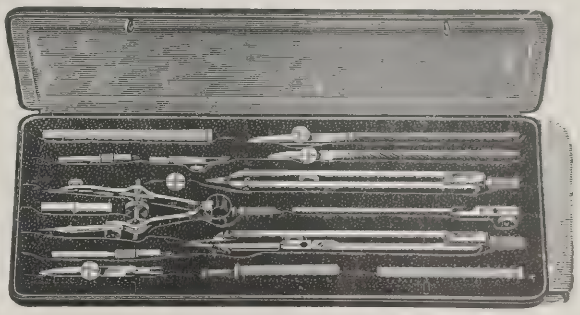
We have made satisfactory arrangements with the best manufacturers, and publish from time to time illustrated lists of the articles supplied with prices, &c., as follows:—

No. 1 List. Sets of Mathematical Instruments.
No. 2 List. Various Scales and Philotechnic Set.
No. 3 List. Drawing Boards, T Squares and Set Squares.
No. 4 List. Drawing and Tracing Paper, Tracing Cloth, &c.
No. 5 List. Inks, Water Colours, Paints, Brushes, &c.

LIST No. 1—PART II.
MATHEMATICAL INSTRUMENTS.

No. R 6.

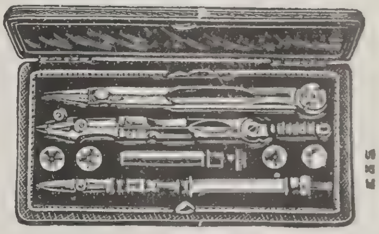
Solid Leather rod-fastening Pocket Case, containing German silver instruments, 6-in. compass with knee joint, pen and pencil legs, lengthening bar, improved hair-spring divider, bow compass, two metal pen or pencil leg holders, 2 hand-ruling pens, and combination case of leads and compass key. **Price 45/-**



No. 46.

Morocco pocket case, silk lined, electrum name plate in centre of lid, and lift-up flap, containing the following superior German silver instruments:—Compass with double knee-joints and needle-points, pen and pencil points, lengthening bar, hair-spring divider, three needle-pointed spring bows, ink and pencil needle-pointed double knee-jointed bows, jointed ivory pen, steel ditto, with ivory parallel and protractor. **Price £3 3s.**

Nos. 68-40.

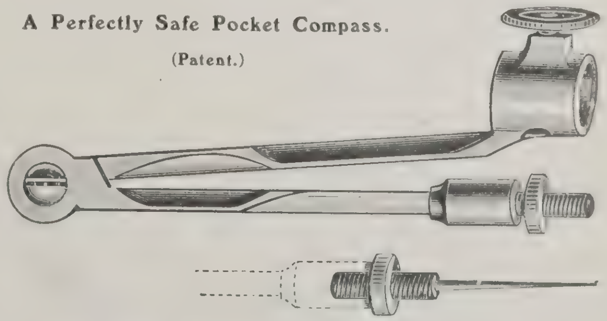


Handsome snap case, with name plate, containing bayonet adjustment double knee-jointed compass (electrum) with bow-head and points to hold needles or leads, combination pen point and handruling pen adjustable to compass, with or without bar-handle, fine divider with deep hollow, case for leads and needles, drawing pins and compass key. **Price 11/6**

A Perfectly Safe Pocket Compass.

(Patent.)

This Compass has a Reversible Point fitted with double screw ends. It takes any pencil, is easily adjusted, and always ready for use.
Price 9d. each.



The above Prices include Postage within the United Kingdom.

All Correspondence and Orders should be addressed to

THE BUILDERS' JOURNAL SUPPLY DEPARTMENT,
Builders' Journal Office, Great New Street, Fetter Lane, E.C.

Advertising Notes.

> *"Facts are good; but reasons are better. One is never quite sure of a fact till he knows the reason for it."*

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterward, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Thursday, April 20th.

ARCHITECT and CIVIL ENGINEER'S MANAGING ASSISTANT desires ENGAGEMENT. Ten years' practical experience of all branches Speciality, sewage disposal.—Apply Box 1066, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT and SURVEYOR'S ASSISTANT desires ENGAGEMENT, A.R.San.I. Nine years' varied experience; measuring up, contract drawings, details, specifications, knowledge of quantities, surveying and levelling. superintending works, &c.—H., 10, Rollscourt Avenue, Herne Hill, S.E. 1069

ARCHITECT and SURVEYOR'S ASSISTANT desires engagement. Good draughtsman. Working and detail drawings. Reference from present office.—W. H. ELLISON, Senior and Clegg, Architects, Barnsley. 1090

ARCHITECT and SURVEYOR'S competent ASSISTANT disengaged; 20 years' practical experience, London and provinces. Good draughtsman, working and detail drawings, specifications, surveying, levelling, &c.—24, Lebanon Road, Croydon. 1047

ARCHITECT'S ASSISTANT (24) desires situation; contract drawings; details, &c.; surveying, assistance with quantities; good experience. —Box 1040, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECTURAL ASSISTANT desires RE-ENGAGEMENT. Seven years' experience. Good references.—F. G. R., 63, Pagoda Avenue, Richmond. 1065

ARCHITECT'S ASSISTANT (25) desires Engagement. Specialities: Libraries, Schools, Domestic Work.—ARCHITECT, Fairlands, Epsom.

ARCHITECT'S ASSISTANT; aged 21; nearly five years' London experience, student R.I.B.A., design, working drawings, surveying, specifications, perspectives, and general routine; salary moderate. —M., 7, Goulton Road, N.E. 1086

ARCHITECT'S ASSISTANT (24). Nine years' good experience. First-class draughtsman, well up in design, working drawings, details, perspectives. —W. H. L., 116, Sugden Road, Clapham Common, S.W. 1089

ARCHITECT, C.E., and SURVEYOR'S ENGAGEMENT REQUIRED. Applicant has twelve years' experience; apprenticeship five years. Had Government appointment. Practised privately. Good references and testimonials.—Reply to SCOTTIE, Box 1055, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S or CONTRACTOR'S ASSISTANT. Six years' experience. Neat draughtsman. Practical knowledge construction, levelling, surveying, drainage, &c. Shorthand, typewriting, specifications, measuring up. Moderate salary.—ARNOLD, 30, London Road, Dover. 1038

ARCHITECT'S JUNIOR ASSISTANT (22). Articled for three years, 1¼ years improver, good knowledge of construction, contract drawings, and details from sketches, surveying; good references; moderate salary.—H. N., Thorncroft, Hale Road, Farnham, Surrey. 1075

ARCHITECT'S JUNIOR ASSISTANT desires ENGAGEMENT. Good training in domestic work.—HODGSON, 1, Branksome Terrace, Bournemouth.

BRICKWORK and POINTING wanted by practical man. Rod or Job. Good refs.—L. H., 7, Newton Road, Isleworth. 1091

BUILDER'S CLERK seeks RE-ENGAGEMENT. Time-sheets, accounts, and usual office routine.—A. G., 56, Stratford Road, Kensington, W. 1050

BUILDER'S CLERK, well up in d.e. book-keeping, time sheets, and general routine; good draughtsman; moderate salary; town or country.—E. W. H., 11, Archibald Road, Tufnell Park, N. 1070

BUILDER'S MANAGING CLERK (35) desires RE-ENGAGEMENT; 16 years' experience; plans, quantities, measuring and billing. Special d.e. book-keeping, profit and loss account, balance sheet, excellent references.—"PRACTICAL," 145, Alexander Road, Moss Side, Manchester. 1068

BUILDER'S or CLERK OF WORK'S ASSISTANT (22). Drawing, tracing. knowledge of quantities and details. 4½ years in Architect's office. Certificates Building Construction (Advanced), perspectives, &c.—Box 1076, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

CARPENTER and JOINER (25) wants JOB. London or suburbs. Bench, fixing, or estate. Three years' references. Moderate wage. Abstainer.—JOINER, 123A, Princess Street, Edgware Road, W. 1049

CARPENTER and JOINER (28), with two years' experience as general foreman, wants JOB. Time-keeping, good manager of men. Well up in plans, &c. Three building certificates, S.K. Abstainer. Good references.—Address E. S., 26, Houblon Road, Richmond, S.W. 1051

DRAUGHTSMAN (disengaged) seeks ENGAGEMENT. Working and detail drawing, etc., levelling. Salary moderate.—A. D. S., 61, Minster Road, West Hampstead, N.W. 1072

FOREMAN of PAINTERS and DECORATORS. Twenty-five years' experience in all classes of work. Good manager, decorator, and colourist. First-class references.—W. P., Poplar Cottage, 28, Haven Green, Ealing, London, W. 1046

GENERAL FOREMAN, age 40, seeks re-engagement. Trade Bricklayer, well up in all branches. Abstainer.—Address 16, Chelmsford Road, Walthamstow, Essex. 1043

GENERAL FOREMAN seeks engagement; thoroughly practical and energetic, well up in plans, measurements, quantities, &c.; good manager; bricklayer; age 42. Good references.—J. LAKE, 86, Melbourne Street, Gloucester. 1087

GENERAL or FOREMAN of CARPENTERS DISENGAGED. Just finished extensive alterations to a mansion in Warwickshire, or would take the management of country branch. Thirty years' experience.—BATES, Walkern Road, Stevenage. 1064

GENERAL FOREMAN seeks RE-ENGAGEMENT. Practical and experienced. Well up in all branches. Nine years with last employer. Age 48. Trade carpenter and joiner.—MOTH, 2, Dora Terrace, Baddow Road, Chelmsford. 1074

PAPERHANGING. Every description UNDERTAKEN in any quantity. First-class workmanship. Moderate charges. Town or country. Prompt attention.—F. STEVENS, 29, Buckingham Road, Harlesden, N.W. 1071

PLUMBER, reliable, wants job; well up in Sanitary Work and Lead Laying, and General Roof Repairs; wages moderate.—B. SMITH, 7, Ludwick Road, New Cross, S.E. 1085

QUANTITY SURVEYOR'S ASSISTANT wants permanency, age 20, working-up, drawing, &c.; ex. refs.—HARRY E. FEW, Richmond House, Bifron Street, Chelsea, S.W. 1088

SHOP or GENERAL FOREMAN requires engagement, used to machinery. Good manager of men; 4 years last job. Qualifications with references. —C., 2, Thurlow Terrace, Maitland Park, N.W. 1042

TO CONTRACTORS and BUILDERS, or those desirous of carrying out large works by direct labour. MANAGING FOREMAN AT LIBERTY. Smart, up-to-date methods employed; specifications prepared; levelling by dumpy, &c. Highest references. —H., 45, Carthew Road, Hammersmith, W. 1084

WANTED IMMEDIATELY, by Young Man with 6½ years' experience in Building Trade, post as ASSISTANT to Surveyor and Sanitary Inspector.—W., 20, Bell Street, Henley-on-Thames. 1044

YOUNG MAN, age 21, wishes to learn PLUMBING. Served his time as painter and grainer. Small wage required.—Apply H. B., 4, Virginia Terrace, Maxton, Dover. 1039

Appointments Vacant.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterward, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Thursday, April 20th.

ASSISTANT WANTED; practical and capable; domestic work.—Apply, stating salary required, BAILLIE SCOTT, Fenlake Manor, Bedford.

WANTED, a First-class BUILDER'S GENERAL FOREMAN, thoroughly well up in all branches; must be capable manager of men and accurate setter-out of work. Total abstainer preferred. Age from 40 to 50. Weekly wages, £3.—Apply by letter only, stating previous experience, to CLERK OF WORKS, Hastings Bros., Ltd., Effingham House, Arundel Street, Strand, W.C.

WANTED, BUILDER'S CLERK.—Prime cost and general office routine, and assist with quantities; state age and salary required.—Apply, C. E. H., 3, Lebanon Road, East Croydon.

Partnerships.

PERSPECTIVES.—Advertiser, of artistic and business abilities, would like correspondence with view to PARTNERSHIP.—Reply, in confidence, to H., Box 680, Smith's Advertising Agency, 100, Fleet Street, E.C. 1033

Drawings, Tracings &c.

HOSPITALS and SCHOOLS.—EXPERT ASSISTANCE on designs. Highly successful in competitions. Moderate and speculative terms.—BOUGHTON, "Woodlands," Ryde. 1073

JUNIOR (20) seeks SITUATION as TRACER, &c., in Drawing Office of Engineers; 5½ years with large city firm. Good references.—Box 1015. BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

Businesses Wanted & For Sale.

ARCHITECT and SURVEYOR wishes to dispose of his Business. Very efficiently fitted, including typewriter. Main road S.W. district. Owner going abroad. Very fine opening for energetic young architect. £50 inclusive.—Apply Box 1041, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

Miscellaneous.

LIFTS.—WM. AUG.'S GIBSON, LTD., formerly President of American Elevator Co., later Managing Director Otis Elevator Co., Ltd. Temple Bar House, 28, Fleet Street, London, E.C.

DRAIN PLANS PREPARED. Drains Tested, Sanitary and General Surveys and Reports. —J. LAWRENCE, Jun., M.R.S.I., A.I.S.E., 112, Shirland Road, W.

FOR SALE, a small fully-equipped up-to-date Constructional Steelworks, London, waterside premises, all new modern electrical machinery, perfect condition, as a going concern, capacity about 2,000 tons finished work per year, can be seen in working order, or machinery can be moved.—Box 1057, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

FRENCH POLISHERS to the trade in all its branches. PIECEWORK wanted. Best workmanship guaranteed. Terms moderate. Estimates free. —LEWIS & LANE, 1, New Street Cottages, Vauxhall Bridge Road, Pimlico, S.W.

HARD CORE for DISPOSAL. About 150 LOADS lying near Westminster Abbey, suitable for mill or roadmaking.—Apply, with offers, to L. WHITEHEAD & CO., LTD., Portland Place North, Clapham Road, S.W.

MARBLE AND GRANITE WORK. Speciality, Shopfittings, Steps, and Monuments.—KELLY & Co., Masons, Mill Hill, N.W., also Kilburn N.W., and Harpenden, &c. Telephone, 1159 Hampstead

TO FLAT AND VILLA BUILDERS.—Special cheap line in internal fire resisting partitions; room saving and sound proof.—Address, PARTITIONS, 60, Watling Street, London, E.C.

TYPEWRITING.—Specifications, &c., accurately typewritten in triplicate, 1½d. folio (72 words), paper included.—JUDGE, jun., 27, Lordsmead Road, Tottenham, N. 1059

WANTED—BUILDERS to send for prices of Joinery, Carcassing and General Woodwork. Special Quotations for large orders of Sashes, Frames, and Stairs.—REID, 91, Mill Hill Road, Acton. 1058

EMPLOYMENT REGISTER.

Too late for Classification.

1084.—MANAGING FOREMAN, smart up-to-date specs. prepared, levelling by dumpy, &c.; highest references.

1085.—PLUMBER, reliable; sanitary work, lead laying and roof repairs; wages mod.

1086.—ARCHITECT'S ASSISTANT (21), 5 yrs. London exp.; Stud. R.I.B.A. design, wkg. drawings, surveying, specns., perspectives, mod. s.

1087.—GENERAL FOREMAN (42), practical; plans, measurements, quantities, good manager, good refs.

1088.—QUANTITY SURVEYOR'S ASSISTANT, age 20; working up, drawing, &c.; ex. refs.

1089.—ARCHITECT'S ASSISTANT (24); 9 yrs. good exp.; 1st class draughtsman, design, wkg. drawings, details, perspectives.

1090.—ARCHITECT AND SURVEYOR'S ASSISTANT; good draughtsman, working and detail drawings; good refs.

1091.—BRICKWORK AND POINTING wanted, rod or job; good refs.; practical workman.

See p. xxii for the Employment Register.

SEE PAGE XXII FOR EMPLOYMENT REGISTER.

WORKING or COMPETITION DRAWINGS, PERSPECTIVES, TRACINGS, PHOTO-COPIES, All kinds of copies, including PERMANENT BLACK LINE on CARTRIDGE or LINEN. **MODELS** OF BUILDINGS, WORKS, ETC., **LITHO-PRINTING.**

THE LONDON DRAWING & TRACING OFFICE, (Estd. 1883.) **98, Gray's Inn Road, W.C.** (Adjoining Holborn Town Hall.)

Telephone, No. 1011 HOLBORN. *Manager*—**JOHN B. THORP.** Telegrams: "DIVIDITORE," LONDON.

SPECIAL NOTICE.

Owing to the Easter Holidays "The Builders' Journal" for next week will close for press on Thursday, April 20th, at 12 o'clock noon, and copy for all Advertisements should reach this office not later than first post on Thursday morning. Advertisements for the Miscellaneous, Appointments Wanted and Vacant Columns for that issue will be accepted up to 5 o'clock on Thursday next.

A special announcement relating to our issue for the 26th will be found on page vi.

READ IT.

Educational.

A COURSE of 16 LESSONS in LAND SURVEYING and LEVELLING, including use of Theodolite, will be commenced second week in May by Mr. Harold Busbridge, A.R.I.B.A., A.R.C.S.; Fee (inclusive of 8 Field Lessons), £2 2s. Also a course of 8 Lessons in Sanitary Engineering; Fee, 12s. 6d. For further particulars apply 229, Burrage Road, Plumstead, S.E.

LAND SURVEYING and LEVELLING. A Course of Lectures (Thursdays) and 8 Field Lessons (Saturday or Monday afternoons at option) commence April 27th. Fee £3 3s.—G. A. T. MIDDLETON, 19, Craven Street, Strand.

R.I.B.A. EXAMS.—**Personal and Correspondence tuition; courses of any duration. Apply for syllabus to Mr. A. G. BOND, B.A. Oxon., A.R.I.B.A., 115, Gower Street, London, W.C. (late Howgate and Bond).**

QUANTITIES.—A course of Correspondence Lectures in this subject (on the London system) is now ready. Also Lectures in Estimating. For particulars apply Box 632, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

R.I.B.A., AND ALL TECHNICAL EXAMINATIONS.—Preparation by Correspondence or personally. First place on 29 occasions in open competition.—G. A. T. MIDDLETON, 19, Craven Street, Strand, W.C.

STRUCTURAL STEELWORK

Correspondence Classes specially for Architects, Assistants, Surveyors, Builders, and Draughtsmen, by the MIDLAND ENGINEERING BUREAU, STRAND, DERBY. Specialists in American and Continental Construction. Thorough Tuition. Send for descriptive booklet J., and read opinions of past students, and press notices, &c.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

EXAMINATIONS

will be held on the following dates:—

The PRELIMINARY EXAMINATION on the 6th and 7th JUNE, 1905.

Applications must be sent in on or before the 29th APRIL.

The INTERMEDIATE EXAMINATION on the 6th, 7th, 8th, and 9th JUNE, 1905.

Applications must be sent in on or before the 29th APRIL.

The FINAL and SPECIAL EXAMINATIONS from the 23rd to the 30th JUNE, 1905.

Applications must be sent in on or before the 27th MAY, 1905.

The Testimonies of Study, etc., with the necessary fees, must accompany the applications, all of which are to be addressed to the undersigned.

W. J. LOCKE,
Secretary, R.I.B.A.
No. 9, Conduit Street, London, W.

BERKSHIRE. Wokingham.

E. C. HUGHES,
Builder and Contractor,
Albion Works, Wokingham.

Recent Work:
CHILDREN'S HOMES, Farnborough. £13,600.
Messrs. HOLMAN & GOODRHAM, Archts., London.
HOTEL and SHOPS, Henley-on-Thames. £12,700.
W. THEOBALD, Esq., Architect, London.
POLICE STATION and COURT ROOMS, Wokingham. £5,600.
J. MORRIS & SON, Architects, Reading.
ALTERATIONS and ADDITIONS at The Coppice, Shiplake. £6,000. For Justice Sir W. G. F. Phillimore, Bart.
W. F. CAVE, Esq., Architect, London.
WORKHOUSE ALTERATIONS and ADDITIONS, Easthampstead. £6,500.
CHAS. SMITH & SON, Architects, Reading.

Contracts Open.

BRENTFORD UNION.

TO QUANTITY SURVEYORS.

The Board of Guardians of the Brentford Union are prepared to receive TENDERS from duly-qualified and experienced Surveyors who may be willing to take off QUANTITIES in connection with proposed additions to their New Workhouse and Infirmary at Isleworth, estimated to cost about £55,000.

Firms desirous of tendering must state a price per cent. for preparing bills of quantities, and the firm whose tender may be accepted will be required to enter into an agreement with the Guardians, *inter alia*, to measure up all deviations at the following rate, viz., half per cent. above the price accepted for preparing bills of quantities on additions, and half per cent. below the price accepted for preparing bills of quantities on deductions. Charges for lithographing will be paid by the Guardians.

Tenders, marked "Quantity Surveyor," with references and particulars of work done, must reach me on or before 4 p.m. on TUESDAY, the 25th instant.

The Guardians do not bind themselves to accept the lowest or any tender

By Order,
WILLIAM STEPHENS,
Clerk to the Guardians.
Union Offices, Isleworth, W.,
April 3rd, 1905.

BOROUGH OF NEW WINDSOR.

NEW POLICE AND FIRE STATION.

The Town Council of the Borough of New Windsor are prepared to receive TENDERS from competent persons for the ERECTION of a NEW POLICE AND FIRE STATION in St. Leonard's Road, Windsor, in accordance with the plans which may be seen at the office of the Borough Surveyor, Mr. E. A. STICKLAND, Alma Road, Windsor.

Bills of quantities and form of Tender may be obtained on receipt of application, accompanied by a deposit of a £5 Bank of England note, which will be refunded to Contractors submitting bonâ fide Tenders.

Tenders must be made out in accordance with the bill of quantities, and delivered to E. CECIL DURANT, Esq., Town Clerk, Windsor, not later than THURSDAY, APRIL 27th, 1905. Each Tender to be in one sum, as set forth in the Tender Form, and to be accompanied by the quantities with each item fully priced.

The Committee do not bind themselves to accept the lowest or any Tender.

By Order,
E. CECIL DURANT,
Town Clerk.
3, Park Street, Windsor,
April 10th, 1905.

CONTRACTORS.

TENDERS are invited for the Erection and Completion of a Block of Dwelling-houses, Clowney Street, Glasgow.

Plans, specifications, and particulars of the work can be obtained at my office.

The lowest or any tender not necessarily accepted.

W. J. MOORE, Architect,
Royal Chambers, 35, Royal Avenue Belfast.

To Contributors.

THE EDITOR will be pleased to consider any articles, illustrated or otherwise, dealing with old and new buildings, methods of construction, or other matter of an architectural character. He will also be glad to consider architectural photographs and sketches (the latter preferably in black and white) and measured drawings of work in this country or abroad. News items of interest to architects and builders will also be considered, provided the name and address of the sender are given; no notice will be taken of anonymous contributions. All communications should be addressed to the Editor of THE BUILDERS' JOURNAL, 6, Great New Street, E.C.

Privileges open to all Regular Readers of the "Builders' Journal."

I.—Free Monthly Advertisements.

1. A Free Advertisement of 12 words in the Wanted or Miscellaneous Advertisement Columns, in one issue of the BUILDERS' JOURNAL during each calendar month will be given to any regular reader.

2. The charge of one penny will be made for each additional word.

3. Advertiser's Name and Address or Box Number must be counted, but will in no case be reckoned as more than five words.

4. All advertisements must be accompanied by the correct remittance, and should a receipt be required a stamped addressed envelope must be enclosed.

5. The Proprietors reserve to themselves the right of refusing any advertisement.

II.—Free Answers to Enquiries.

1. The services of a large staff of experts are at the disposal of all regular readers who require information on architectural, constructional or legal matters.

2. Questions should in all cases be addressed to the Editor, and be written on one side of the paper only.

3. Correspondents are particularly requested to be as brief as possible.

4. The querist's name and address must always be given, not necessarily for publication

Note.—Owing to the large number of enquiries we receive weekly, we are compelled to restrict the advantages of this department to Regular Readers.

III.—Free Accident Insurance of £500.

1. Every regular reader of the BUILDERS' JOURNAL is entitled to the benefit of this Insurance.

2. A Pamphlet giving full details of this and other Insurance schemes inaugurated by the BUILDERS' JOURNAL for the benefit of its readers, and guaranteed by "The Ocean Accident Corporation, Limited," will be sent on application.

What is a Regular Reader?

We have employed the term "Regular Reader" throughout these announcements as the description "subscriber" is often understood to mean one who subscribes direct to the publishing office.

We mean by a Regular Reader anyone who has placed an order with us or any newsagent or bookstall for the BUILDERS' JOURNAL for one year.

Those readers who order the BUILDERS' JOURNAL through their local newsagent or bookstall should send us the newsagent's receipt. Their names will then be placed on our subscribers' list, and they will be entitled to all the advantages set out above.

5 O'CLOCK P.M. THURSDAY, APRIL 20, IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS FOR NEXT WEEK'S ISSUE. OFFICE: 6, GREAT NEW STREET, FETTER LANE, E.C.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Abertridwr.—Accepted for the erection of a Welsh Baptist chapel. Mr. G. A. Lundie, architect, 53, Queen Street, Cardiff :—

R. Jones, Abertridwr, near Cardiff	£1,820

Audenshaw (Lancs).—Accepted for the erection of fourteen dwelling-houses. Messrs. Burton & Percival, architects, 15CA, Stamford Street, Ashton-under-Lyne :—

General trades.	
F. Woolley, Waterloo, Ashton-under-Lyne	£2.310
Plumbing and glazing.	
H. Pike, Hooley Hill, Manchester	207

Bangor.—For the erection of new chapel, lecture-room, classrooms, &c., at Glanadda. Messrs. Richard Davies & Sons, architects, Bangor :—

J. M. Jones	£4,823
W. Williams	4,674
E. Jones	4,400
W. Jones	3,604
R. Jones	3,575
R. & J. Williams,* Upper Bangor	3,404

* Accepted.

Beckenham.—For the erection of semi-detached houses in Whitmore Road (Eden Park Building Estate). Messrs. J. Carter Jones & Sons, architects, Cambridge :—

E. P. Bulled & Co.	£3,620
Kerridge & Shaw	3,600
W. Saint	3,400
Syme & Duncan	3,350
Smith & Wilson	3,133
J. Stewart	3,084
Jones & Andrews	2,770
G. H. Weaver	2,715
S. L. Grist*	2,600
E. Wallis*	2,600
A. W. Jaggers & Co.	2,450

* Accepted.

Bristol.—For the erection of two houses at St. Andrew's Park, Montpelier, for Mr. G. Flook. Mr. W. H. Watkins, architect, 15, Clare Street, Bristol :—

E. Love	£1,846
H. W. & E. I. Neale	1,800
R. F. Ridd	1,790
W. Foster	1,685
A. Dowling	1,550
W. & J. Bennett	1,500
T. R. Lewis	1,415
A. J. Beaven*	1,299

* Accepted.

Caerleon (Mon.).—For the erection of a pair of villas in Museum Street, for Messrs. J. & W. Banner. Messrs. J. H. Rennie & Co., architects, Newport. Quantities by the architects :—

J. Hooper	£2,500	0	0
E. C. Jordan	2,240	0	0
D. W. Pugh	2,190	10	0
R. Clements & Co.	2,090	0	0
J. B. Jenkyn	2,030	0	0
J. Dean & Son	2,008	0	0
C. H. Reed	2,000	0	0
J. J. Partridge	1,880	0	0
H. J. Bambury	1,875	0	0
J. Charles,* Crindau, Newport	1,849	0	0

* Accepted.

Eccles.—Accepted for the erection of a temporary school, with permanent boundary walls and sanitary conveniences, in Beech Street, Winton, for the Corporation :—

N. Brookes & Son, Ellesmere Street, Patricroft	£1,454	2	4

Evenwood (co. Durham).—For alterations and additions to club and institute. Mr. T. Farrow, architect, 7, Market Place, Barnard Castle. Quantities by architect :—

All trades.			
P. C. Scott, Aycliffe	£585	1	5
Bricklayer and mason.			
J. Teward, Cockfield	317	12	7
Joiner.			
W. Hope & Sons, Coundon	180	0	0
Slater.			
J. Muscall, Bishop Auckland	27	0	0
Bricklayer, mason and plasterer.			
A. Archer,* Evenwood	306	10	6
Joiner, plumber, glazier and painter.			
M. Turnbull & Sons,* Cockfield	201	4	0
Slater.			
J. Lancaster,* Barnard Castle	26	14	0

* Recommended for further consideration, after amended tender.

Halifax.—Accepted for the rebuilding of the Kebroyd Mills, Triangle, for the trustees of the late Mr. G. B. Hadwen. Messrs. Jackson & Fox, architects, 7, Rawson Street, Halifax :—

Mason.			
Crawshaw Brothers, Woodville, Ripponden, near Halifax	£1,767	10	0
Joiner.			
C. & W. Whiteley, Rishworth, near Halifax	1,293	0	0
Ironfounder.			
J. Berry, New Bank, Halifax	1,065	0	0
Slater.			
Rushworth & Firth, New Bank, Halifax	578	0	0
Plumber.			
J. Stafford, Sowerby Bridge	241	0	0
Painter.			
A. Berry, Triangle, near Halifax	39	10	0

Hauxley.—Accepted for the erection of a Council school, for the Education Committee of the Northumberland County Council —

Brown & Co., Amble	£1,926	2	0

Hope.—For the erection of a school, for the Flintshire County Council. Mr. S. Evans, county surveyor and architect, County Buildings, Mold :—

W. E. Samuel	£4,800	0	0
A. White & Co.	4,652	13	4
Higgens	4,260	0	0
J, E. & A. Whitehouse	4,207	12	7
W. H. Wycherley	4,189	0	0
P. Edwards	3,950	0	0
Parker Brothers	3,873	0	0
J. Mayers	3,838	0	0
R. Peters	3,750	0	0
E. J. Mills	3,708	7	8
E. O. Probert	3,630	6	0
J. Challiner	3,596	0	0
H. Kelly & Brothers	3,521	0	0
G. Wright & Sons	3,515	0	0
E. Blane	3,500	0	0
R. Williams,* Brymbo	3,300	0	0

* Accepted.

Letchworth.—For the erection of a house in Norton Road, Letchworth (Garden City), for Mr. F. H. Sidley. Mr. W. B. Stonebridge, architect, Woburn Sands, Beds :—

Foster & Co.	£1,562
S. Redhouse	1,420
A. Nash	1,329
J. Corby	1,322
Miles Brothers	1,300
T. Raban & Son	1,200
C. Sinfield	£1,147
A. Collins	997

Llantwit Major.—For the erection of a Congregational chapel. Messrs. Cook & Edwards, architects, Bridgend :—

P. Gaylard	£1,586	0	0
Price Brothers	1,498	0	0
Lloyd & Tape	1,466	8	0
W. A. Cooksley	1,400	0	0
J. Lloyd	1,389	0	0
Knox & Wells	1,379	0	0
J. Chatterton,* Lantwit Major	1,373	13	3
E. Preece	1,340	5	0
R. Jones	1,313	6	6

* Accepted.

London, E.—For repairs and decorations to "The Half Moon," Bow. Mr. Herbert Riches, architect, 3, Crooked Lane, King William Street, London, E.C. :—

Clemens Brothers	£165	10	0
Elkington & Sons	165	0	0
T. Osborn & Sons	158	0	0
J. T. Robey	147	10	0
A. W. Derby*	120	0	0

* Accepted.

London, E.—For repairs and decorations to "The Prince of Wales" public-house, Bethnal Green. Mr. Herbert Riches, architect, 3, Crooked Lane, King William Street, E.C. —

W. Irwin	£357
T. Osborn & Sons	299
Elkington & Sons	245
J. T. Robey*	228

* Accepted.

(Continued on p. xx.)

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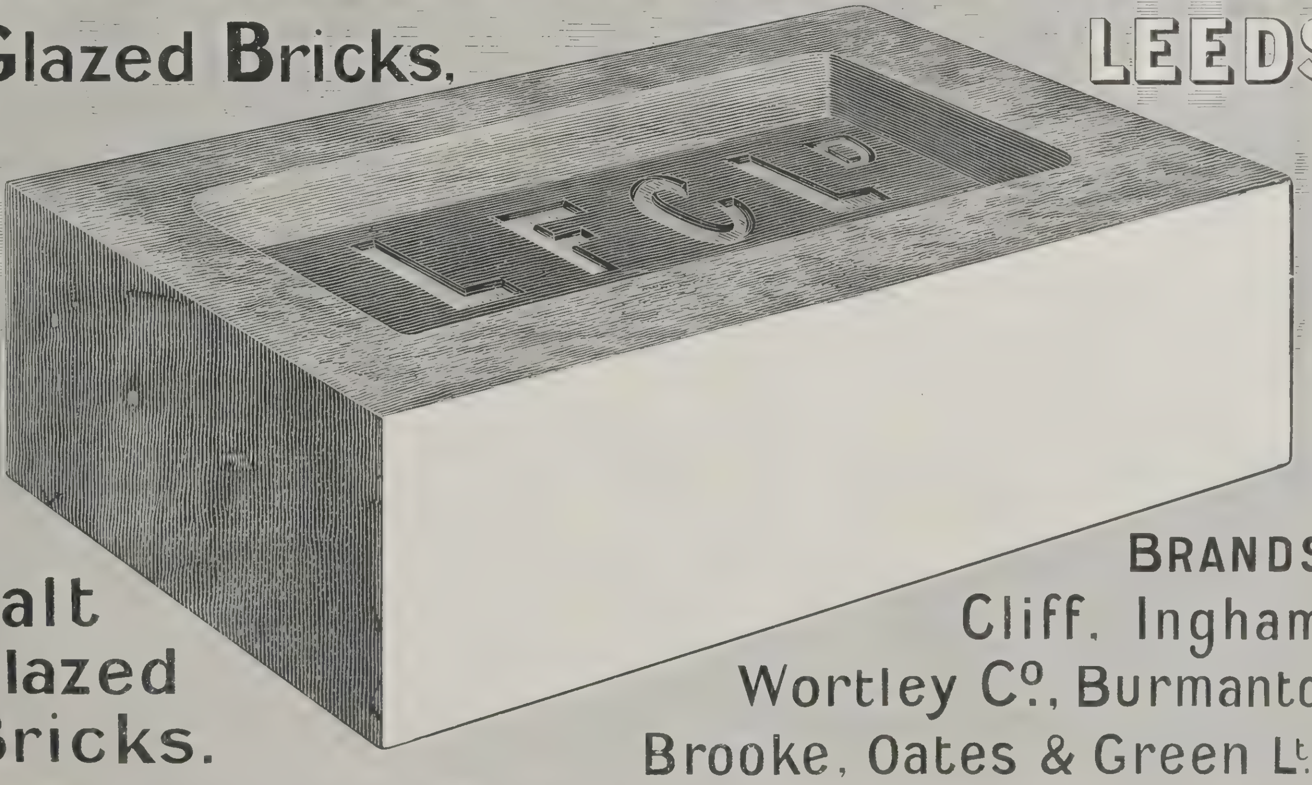

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Wortley Co., Burmantofts
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TENDERS—*cont. from p.* xviii.

Manchester.—Accepted for the foundation work at the new infirmary at Stanley Grove. Messrs. Edwin T. Hall & John Brooke, joint architects :—

Harold Arnold & Son, Leeds and Doncaster	£26,360		

[Nine tenders received.]

Merthyr Tydfil.—For the erection of two ward pavilions, observation pavilion, administrative block, &c., on the Mardy Estate, for the U.D.C. Mr. Thomas F. Harvey, A.M.I.C.E., architect (engineer and surveyor to the Council). Quantities by Mr. E. A. Johnson, F.R.I.B.A., Merthyr Tydfil :—

E. Williams, Dowlais	£18,221	10	0
J. Allen, Cardiff	17,500	0	0
Lattey & Co., Cardiff	17,216	1	2
Jones Brothers, Quaker's Yard	17,215	15	6
L. Davies, Abercynon	16,935	0	0
W. Brown, Merthyr Tydfil	16,923	19	6
E. Thomas, Seven Sisters, Glam.	16,498	10	0
S. Shepton, Cardiff	15,900	0	0
J. Lewis, Caerphilly	15,827	0	0
W. Watts, Dowlais	15,226	13	11
E. Jones, Dowlais	14,900	0	0
D. Davies, Cardiff	14,450	0	0
W. Bowers, Hereford	13,980	0	0
J. G. Thomas, Abergavenny	13,900	0	0
J. Linton,* Newport, Mon.	13,403	12	2

* Accepted.

Mold.—For the erection of an extension to the county office, for the Flintshire County Council. Mr. S. Evans, county surveyor and architect, County Buildings, Mold :—

R. Jones	£3,520	0	0
E. O. Probert	3,049	10	6
P. Edwards	2,995	0	0
M. S. Rogers	2,961	8	0
R. Williams	2,693	19	4
Parker Brothers	2,675	0	0
J. Mayers & Sons	2,647	0	0
G. Wright & Sons	2,490	0	0
T. Roberts,* Mold	2,234	8	6

* Accepted.

Newport (Mon.).—For the erection of an addition to premises of the Cardiff Pure Ice and Cold Storage Co. in Shaftesbury Street. Mr. W. M. Corbett, architect, Castle Street, Cardiff :—

E. C. Jordan, Newport	£13,781
Knox & Wells, Cardiff	9,398
J. T. Partridge, Newport	9,349
J. Charles, Newport	9,215

Putney.—For the erection of three shops. Mr. Herbert Riches, architect, 3, Crooked Lane, King William Street, London, E.C. Quantities supplied :—

H. B. Oldrey & Sons	£4,970
J. Dorey & Co., Ltd.	4,875
H. Burman & Sons	4,822
T. Adamson & Son	4,750
S. N. Soole & Son	4,600
W. R. Williams	4,297
Courtney & Fairbairn*	4,097

* Accepted.

Scole (Norfolk).—For alterations and additions to Scole House, for Mr. Thomas Keppel, J.P. Mr. Arthur J. Lacey, architect and diocesan surveyor, Norwich :—

J. Wade, Long Stratton	£1,218	4	0
W. H. Ludkin, Attleborough	1,175	0	0
Gunton & Palmer, Norwich	1,160	0	0
W. Limmer, Scole	1,120	0	0
J. C. Pollard, Scole	1,090	0	0
H. Hipperson, Harleston	£1,079	0	0
J. J. Howes,* Norwich	1,049	0	0

* Accepted.

Swanley Junction (Kent).—For the erection of a residence, for Mr. William G. Burgess :—

J. Lonsdale, Swanley Junction	£1,575
W. F. Blay, Dartford	1,550
J. Ellingham & Sons, Dartford	1,475
Burton & Johnson,* Fulwich Road, Dartford	1,325

* Accepted.

Shinfield, near Reading.—For the construction of York Pool Bridge, for the Berkshire County Council. Mr. Joseph Morris, county surveyor :—

W. A. Baker & Co., Newport, Mon.	£1,569	9	9
Francis Morton, Liverpool	1,551	4	11
Pedrette & Co., London	1,491	0	0
H. W. Godwin, Reading	1,486	0	0
Cunningham Forbes, Hants	1,441	8	3
J. H. Vickers, Nottingham	1,345	0	0
Alexander Findlay & Co., Motherwell	1,216	16	11
Long & Allen, Reading	1,208	4	10½
A. T. Catley, London	1,190	0	0
Heenan & Froude, Manchester	1,180	0	0
Woods & Moir, London	1,175	6	8
Fulham Steel Works, London	1,150	0	0
Needham & Lowe, Leicester	1,135	0	0
A. D. Dawnay & Sons, London	1,132	2	9
Cleveland Bridge Co., Darlington	1,116	12	8
Rogers & Wood, London	1,098	0	0
Richards & Sons, Leicester	1,077	0	0
W. Manders, Leyton	1,077	0	0
Alfred Thorne, London	1,075	0	0
East & Hyde, Binfield	1,063	0	0
Toogood & Co., Reading	1,056	16	0
J. O. Brettell, Worcester	1,039	0	0
Jesse Tildesley, Willenhall	1,038	16	7
George Pilgrim, Reading	1,033	0	0
E. C. & J. Keay, Birmingham	1,012	0	0
G. H. Tucker, Reading	952	0	0
A. J. Ellis, Reading	950	0	0
Gilbert Thompson, Birmingham	903	10	0
C. W. Cox & Sons, Maidenhead	900	0	0
Parsons & Co., Bradford	866	11	0
E. Wheeler, Spencer's Wood, Reading	[illegible]48	10	0
Thomas Turner,* Blackwater, Hants	845	4	0

[County surveyor's estimate, £911 10s.]

* Accepted.

Sheringham (Norfolk).—For the construction of public lavatories, cloak-rooms and promenade approach, for the U.D.C. Mr. T. Inglis Goldie, A.R.I.B.A., architect, Bank Plain, Norwich, and Sheringham :—

C. A. Sadler	£2,100	0	0
J. W. Weston	2,002	15	0
Hannent	1,947	0	0
H. Bullen	1,850	0	0
Edwards & Utting*	1,809	19	1

* Accepted. [Architect's estimate, £1,800.]

Warley.—For the erection of steel and wrought-iron fencing at sewage pumping station, for the Oldbury U.D.C. Mr. J. T. Eayrs, M.I.C.E., engineer :—

Howardson & Co., London	£223	1	0
Hewitt Brothers, Golborne, Lancs.	307	7	6
A. Rushworth, Dudley	179	17	0
Miller & Son, Wolverhampton	175	0	0
Bayliss, Jones & Bayliss, Wolverhampton	165	6	2
Hill & Smith, Brierley	164	2	8
Rubery & Co., Darlaston	159	1	3
J. Elwell,* Sherbourne Street, Birmingham	145	0	0

* Accepted.

Wellington.—For the erection of a new Roman Catholic Church and Presbytery. Mr. Myles Morley, architect, Wellington :—

Mansell, St. George's	£5,537
Treasure & Son, Shrewsbury	4,787
A. Roper, Wellington	4,713
Healey, Market Drayton	4,670
Muirhead, Newport	4,656
Allen, Birkenhead	4,650
A. Pearce, Wellington	4,500
J. Carver, Wellington	4,450
Hayes, Shrewsbury	4,200
Skellorn,* Stafford	3,800

* Accepted.

Worksop (Notts.).—For the erection and completion of two cottages, for the Worksop Waterworks Company. Mr. T. Webster, architect and surveyor, 8, Newcastle Avenue, Worksop, Notts. :—

J. Doncaster	£869	0	0
G. C. Middleton	700	0	0
W. Hemstalk	660	8	0
Bowles Brothers	650	0	0
G. Wright	628	0	0
Leverton	620	16	0
Chadwick	610	0	0
Taylor	593	10	0
Ilett & Sons*	445	0	0

* Accepted. [All of Worksop.]

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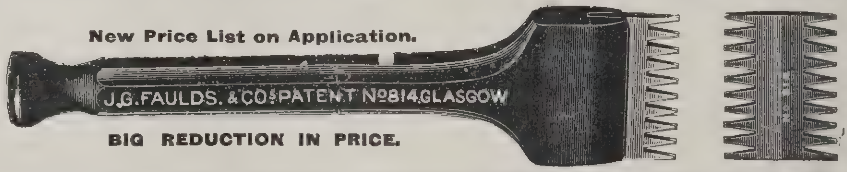

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THE

BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

April 26, 1905. Vol. 21, No. 533.

6, Great New Street, Fetter Lane, E.C.

Summary.

A striking feature in the erection of the new Government Offices in Parliament Street, Westminster, is the use of wrought iron ribs and lathing to replace the usual forest of furring and lathing. The ribs are bent and fixed by smiths on the job, and the work is of great exactitude. The electric cranes are also a noticeable feature. The friction contact by which these work enables the whole weight to be taken off a block of stone without lifting it from its bed, so that the masons can put it into place with the greatest ease and exactitude. Portable tramways have been found of great convenience in handling materials. (Page 213.)

Much hardship and unfairness is caused by the present law in regard to combined drainage, and both in the Metropolitan area and in the provinces the necessity for its amendment is admitted, though there is difference of opinion as to the form the amendment shall take. Under the existing law the private owner is responsible for the maintenance of the whole system, whereas, if two or more premises are drained by a common drain without an order of the local authority, the latter is responsible for the portion which receives the drainage of both or all of the premises. (Page 214.)

The design of a wall for a swimming bath and the heating capacity required is discussed on page 236.

Whereas the common interpretation of the formulæ for the strength of rectangular beams as based upon extreme fibre stress would give a factor of $13\frac{1}{2}$ for c, in the case of a cast-iron beam it is actually 20, and therefore a beam designed for a maximum fibre stress equal to the working stress in direct tension or compression will probably be much stronger than it is supposed to be. (Page 218.)

The attention of the Factory Department of the Home Office has been directed to alleged injury to health and risks from fire in the manufacture of xylonite and celluloid, and in the use of those materials for manufacturing purposes, and it has issued a memorandum on the subject, in which it is stated that it would appear that by the general observance of recognized measures of precaution, already adopted in certain works, further security may be obtained. (Page 232.)

The restoration of one of the oldest and most interesting buildings in York—St. William's College - has been commenced. (Page 234.)

At the bridge works of Sir William Arrol & Co. at Glasgow there is a "template" floor on which the whole of the work is drawn out full size. (Page 234.)

The bricklayers at Dublin have accepted Alderman Cotton as arbitrator between themselves and the master-builders. (Page 234.)

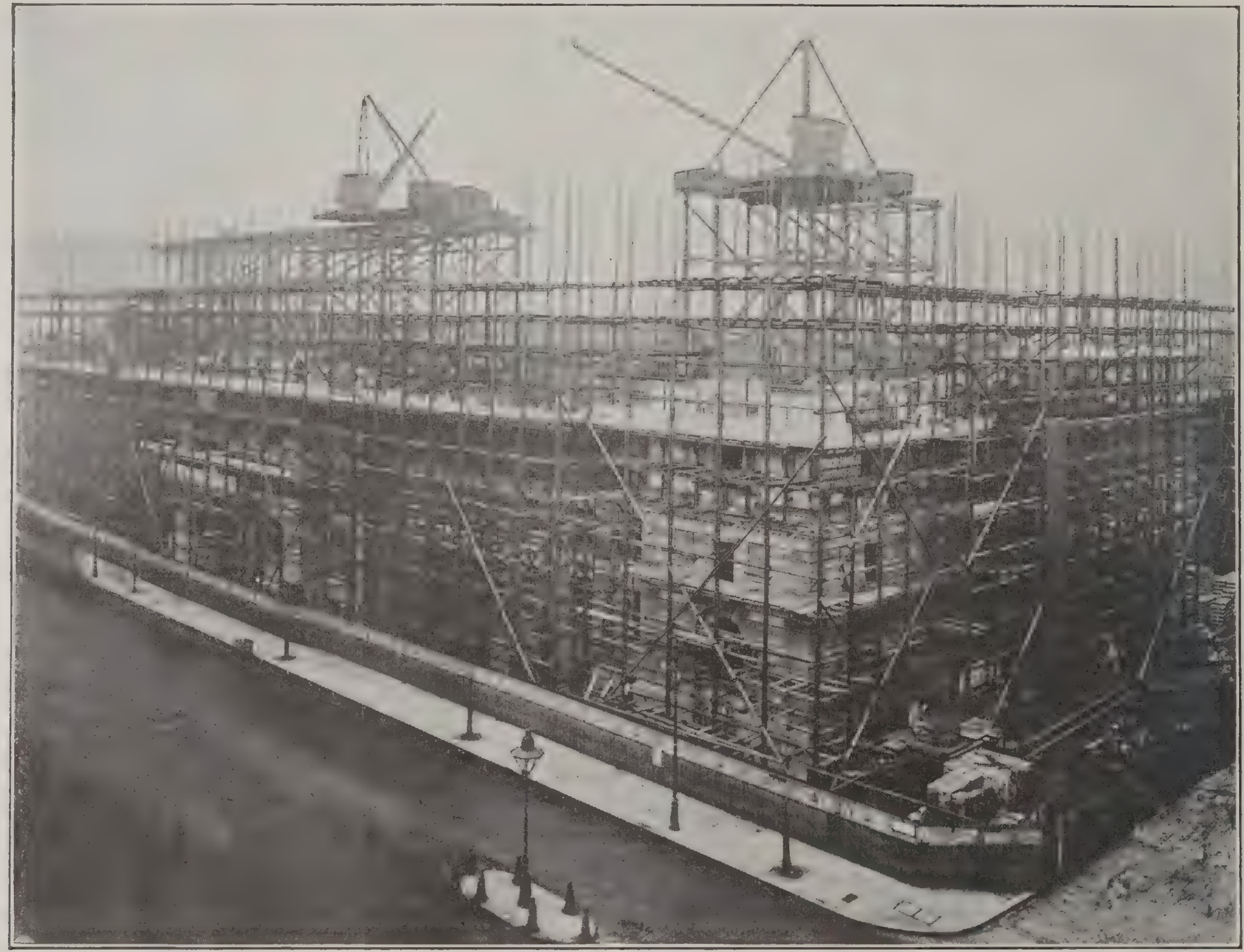
Elementary Schools. Now that the Education Act has come into force and the education committees throughout the country are elaborating their proposals, we hear much outcry in the daily press against the increase in taxation. We do not propose to take sides in this battle of interests, which promises to wax warm, but we are directly concerned with the question of altering existing schools and erecting new ones, which seems to be one of the chief causes of increasing taxation. There is not the slightest doubt that a large number of the elementary schools throughout the country are unsuitable for their purpose. Many of them are old and do not conform to modern ideas. It should be recognized that there has been a steady growth of knowledge in school planning, and also in building construction and sanitation. We do not suggest that all these old schools should be remodelled to bring them up to one standard, but we do think that many of them are so insanitary as to be a national danger. It is easy to call attention to the fact that some of these schools hold a high record for success in examinations. Of course this largely depends upon the teachers, and these successes in no way show the physical deterioration which they may have caused, nor the deficiencies as regards supervision and easy working. Educational ideals have progressed, and will, it is to be hoped, still further advance, and unless we take the matter in hand now we shall only find an increasing drag on the wheel. It seems to be thought that drains are the beginning and end of school hygiene, but a far more important matter as regards the health of children is the ventilation and lighting, both of which are hopelessly bad in many elementary schools. At the time these were built, too, fire protection was not often considered, and one is in constant fear of some apalling catastrophe. If the alteration in the educational system of this country results in eradicating these objectionable features it will at least have substantiated the claim of increased efficiency made by its advocates.

The Design for the London County Hall. Now that the London County Council have purchased the Westminster Bridge site for their new offices, it is opportune to consider the manner in which the design for the building is to be secured. The competition system is not always an unmixed blessing, but this surely is a case when it is unquestionably the best thing to do. There is no architect available of sufficient prominence and able to command general respect to whom we could entrust the problem, and we think a preliminary open competition ought to be held, from which a few men should be selected, as with Liverpool Cathedral and the Wesleyan Hall at Westminster. We do think, however, considering the admirable work which Mr. W. E. Riley has produced as superintending architect to the London County Council, that he ought to be allowed to compete on an equal basis with unofficial architects. The London County Council estimate the total cost of the building at not more than £1,100,000. It is interesting to compare the cost of the town halls at Manchester, Glasgow, Liverpool, Birmingham and Leeds, which was as follows:—

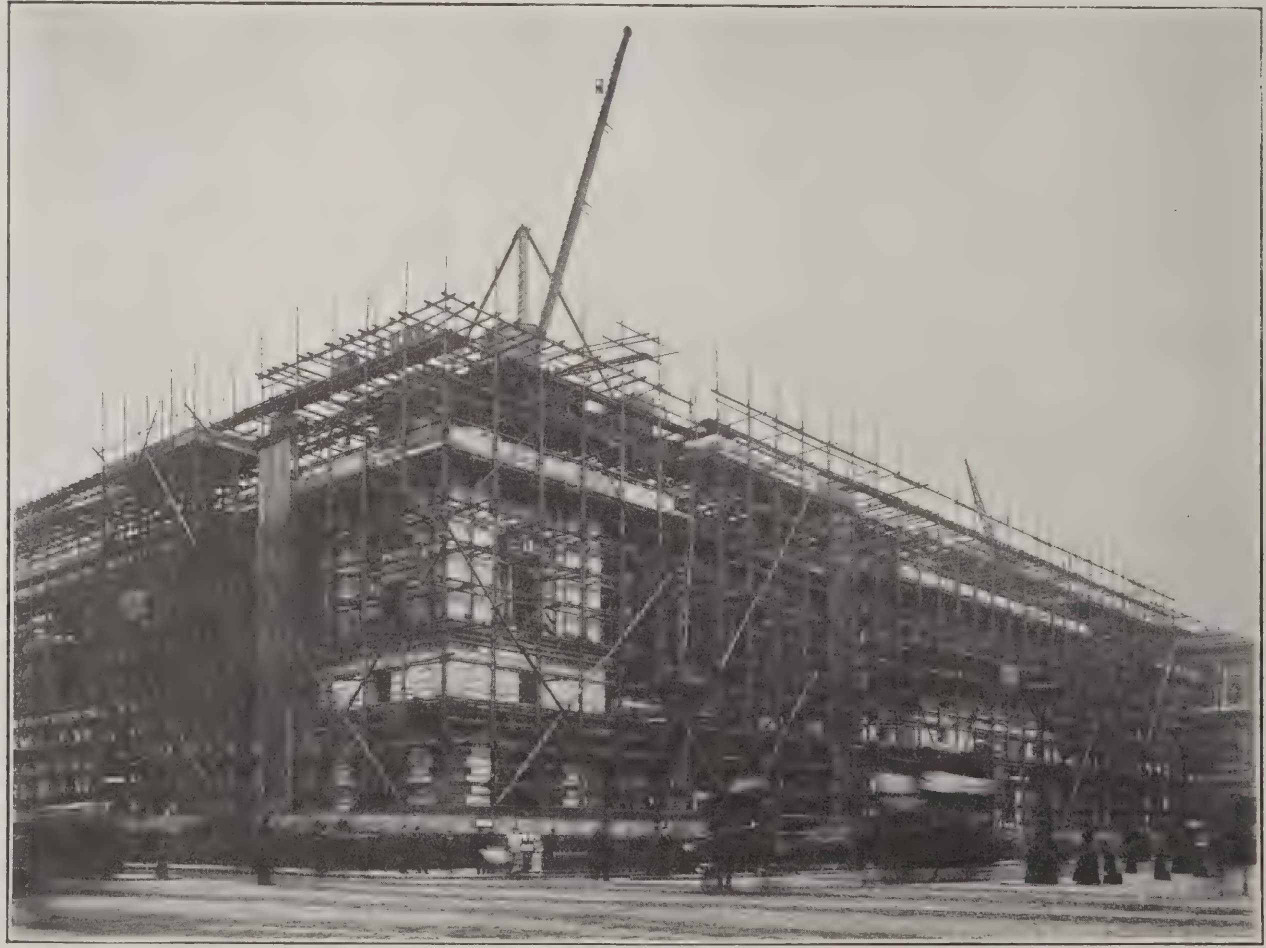
	£
Manchester - - - -	1,050,000
Glasgow - - - -	530,000
Liverpool - - - -	270,000
Birmingham - - - -	250,000
Leeds - - - - -	250,000

Manchester Town Hall, it will be remembered, was designed by Mr. Alfred Waterhouse.

Consumption among Stonemasons. ATTENTION to the publication of an interesting and important pamphlet is called by the "Manchester Guardian." It has been written for the operative stonemasons of Newcastle-on-Tyne by Dr. Arthur T. Wear, physician to the Newcastle Hospital for Consumption and Diseases of the Chest, who quotes some remarkable vital statistics of the local lodge which have not only justified the inclusion of what is generally regarded as a healthy out-door occupation among dangerous trades, but pointedly questions the adequacy of a mere proposal to shorten the hours of employment as a remedy, though this is really the practical point of the medical plea. During the last twenty-five years there have been 191 deaths among members of the local lodge of stonemasons, and 111 of these were attributed to phthisis. Whilst for the whole of the country the average life of the stonemason is fifty years, in this district it is but forty-six years and a month. Apparently this is accounted for by the fact that banker hands, among whom phthisis appears to be specially prevalent, are here proportionately numerous, and that a high mortality is the result. It may be, too, that the sandstone which is so largely used locally for facings gives off more than the average quantity of dust, the form of phthisis from which the stonemason suffers being essentially a dust disease, directly caused by the constant inhalation of irritating particles of stone dust into the lungs. A shortening of hours would obviously reduce the danger to that extent, but it is suggested that the general use of an effective respirator during working hours would appear to be a more promising preventative.

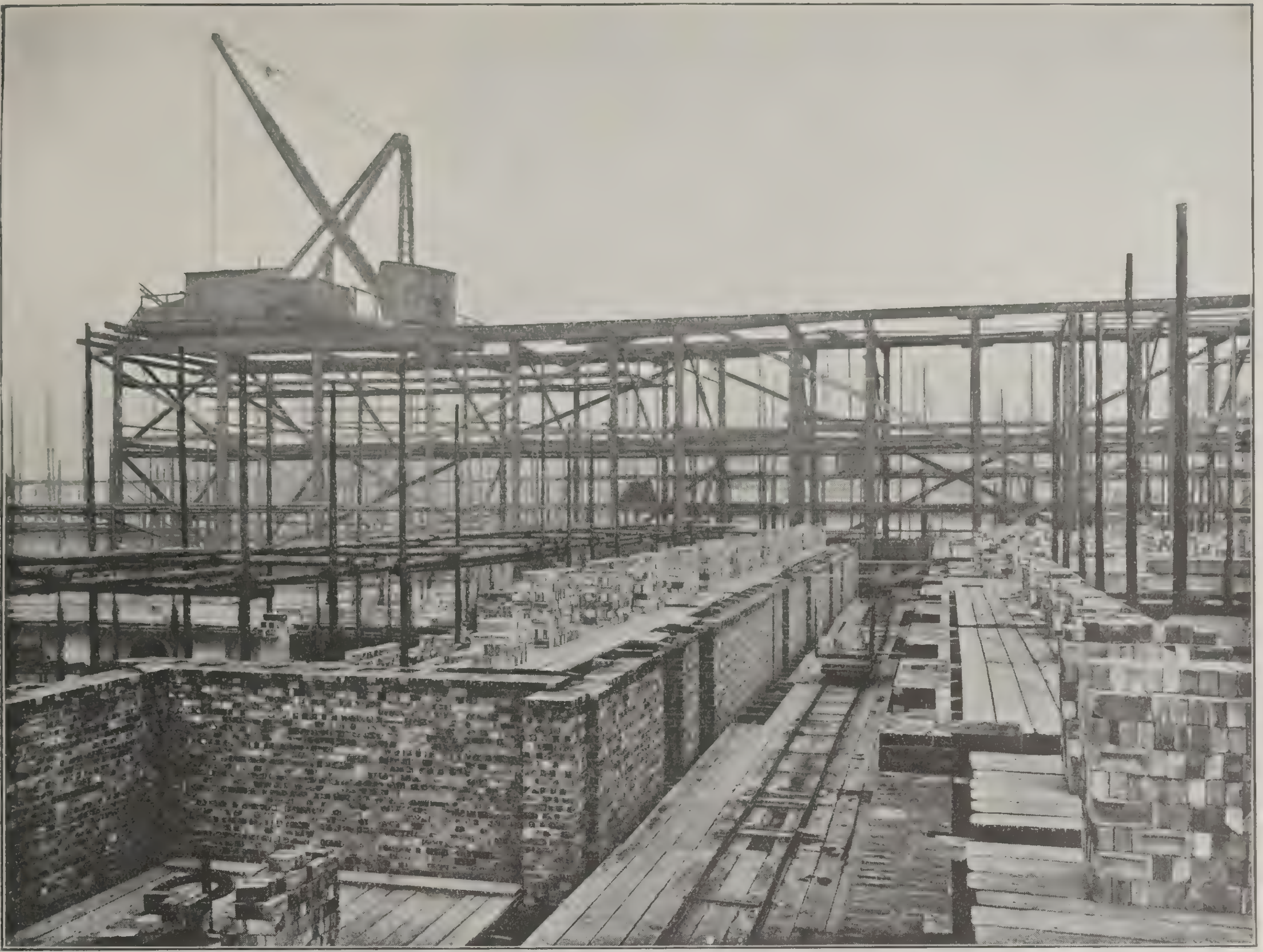


(Photograph taken on October 27th, 1904.)



(Photograph taken on April 13th, 1905.)

NEW GOVERNMENT OFFICES, WHITEHALL. THE LATE J. M. BRYDON, ARCHITECT.



NEW GOVERNMENT OFFICES: VIEW FROM CIRCULAR INTERIOR COURT LOOKING TOWARDS WHITEHALL.

NEW GOVERNMENT OFFICES.

IN this issue we publish several photographs of the new Government offices in course of construction at the lower end of Parliament Street, Westminster. In our issue for April 5th, 1899, we gave a perspective and plan of the late Mr. J. M. Brydon's design for the building, at the time of its first exhibition to the members of the House of Commons. Only very slight variations from that design have been made. The alterations are chiefly of a practical nature, the most important being the continuation of the original small portions of the top floor around the whole building: these, however, do not affect the elevations as designed by Mr. Brydon. Only a portion of the design is at present being erected, consisting of about three-fifths of the whole. The building, which is being erected under the supervision of Sir Henry Tanner, architect to the Office of Works, will eventually have a frontage of about 800ft. to Great George Street and more than 300ft. to Parliament Street. The longer rear frontage is to Charles Street and the shorter rear frontage to St. James's Park. It will be gathered from the general views which portion of the building is at present being proceeded with. Generally speaking, it includes the block facing Parliament Street, and half of the circular court in the centre. This central court, an important feature of the design, is 160 feet in diameter. There are also two 100ft. square courts and a number of smaller courts throughout the building. Mr. Brydon's design consists of two storeys of plain rusticated work supporting on the Parliament Street front two storeys of Corinthian order with two storeys of windows between the columns. There are sculptured pediments along this and the other frontages. The first portion of the contract was for the foundations, and was carried out by Messrs. John Mowlem & Co. These foundations may be described as a concrete dock, and are on what is generally known as the raft system. The erection of the superstructure is being carried out by Messrs. Spencer, Santo & Co., the well-known firm of contractors, who are making good progress with the job, considering the monumental nature of the building and the large extent of it. They are now up to the height of the main cornice.

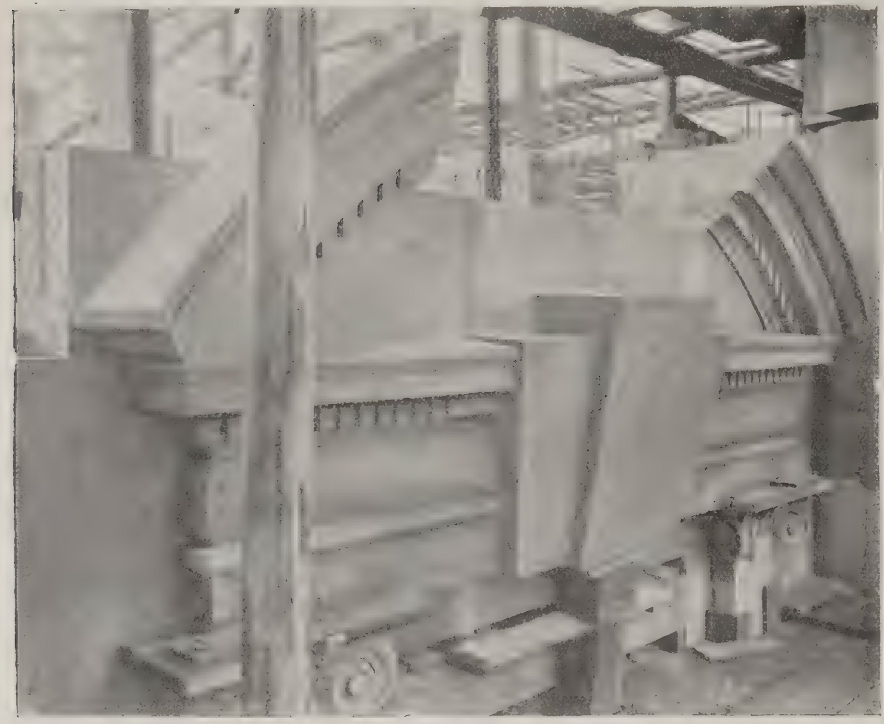
The Portland stone work is naturally very important, and great care has been taken in the selection of the stone, which is supervised at the quarries as well as on the job. Many of the stones are of very great weight, and in handling them the electric cranes, which are a striking feature on the job, have been extremely useful. With the ordinary steam crane, the piston stroke prevents the nicety of adjustment which is possible with an electric crane, for by means of the electric cranes at this building, which lift by friction contact, the whole weight can be taken off a stone without lifting it from its bed, so that the masons can put it into place with the greatest ease and exactitude. It will be seen from our view on this page that the contractors are making use of portable tramways, which have been found of great convenience in handling materials. The whole of the management of the job is carried out on the site in the contractors' offices, which are situated in the central court.

In addition to the general views, we give a number of details of particular interest. The photographs of the upper portion of the windows, in addition to the instruction they convey as to stone detailing, illustrate several points to which we desire to call attention. On the left of the curved pediment on p. 214 it will be noticed that a small portion is left rough. When the blocks are fixed this is worked smooth to a hollow, as shown in the pediment on p. 215. This is designed with the object of throwing rainwater away from the face of the wall, thus obviating the disfiguring streaks one usually finds down the sides of windows in stone-fronted buildings Another point clearly shown in these views is that the dentils are not worked right up to each joint, thus avoiding injury in fixing and permitting the spacing of the dentils to be equalized. Strips of zinc are fixed into the stonework and left hanging over any projections from the face, as shown on the top of the triangular pediment illustrated. These zinc strips serve to hold the casings for protecting the work from damage from falling bricks or refuse.

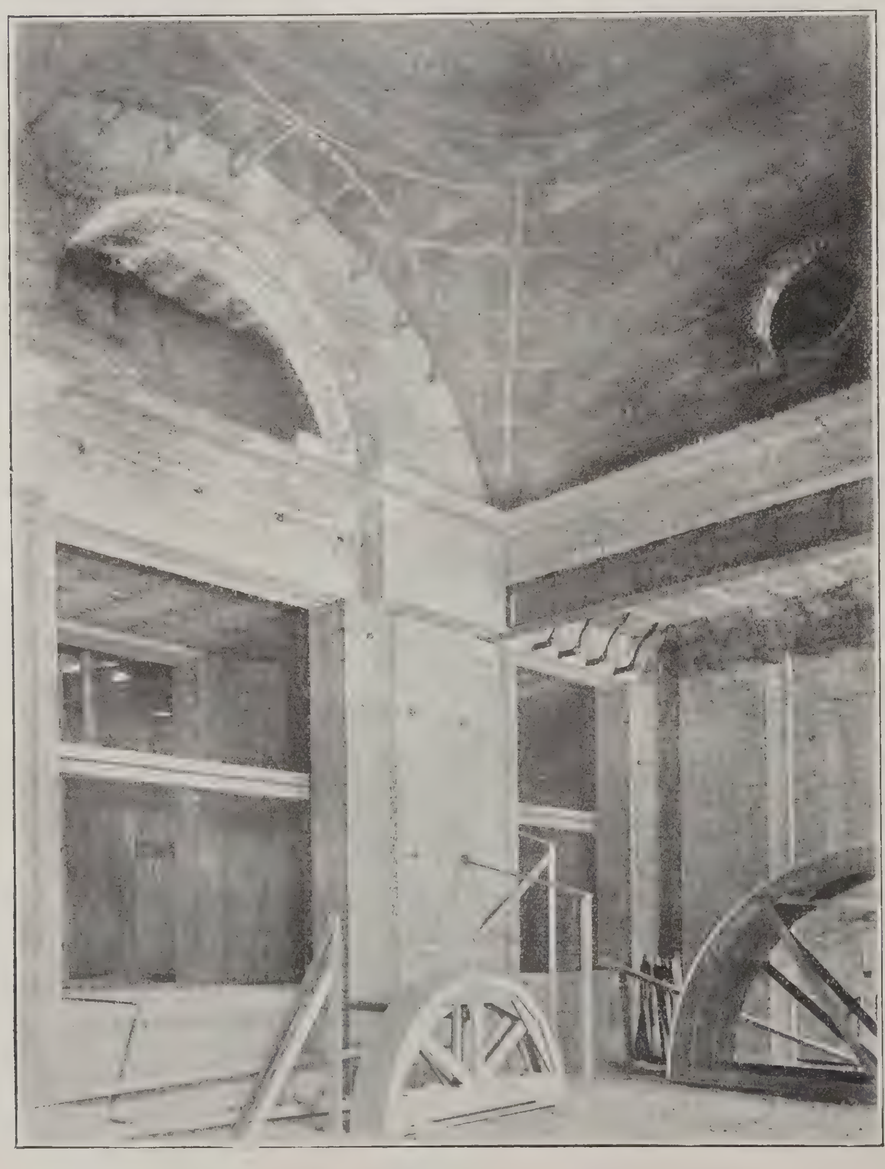
A striking feature of the job is the use of metal ribs and lathing to replace the usual forest of furring and lathing. We publish on p. 214 a view of the main entrance hall from Parliament Street with the wrought-iron ribs to receive the expanded metal lathing of the plaster dome and the cornice. We also give a detail view of the ribs of the dome and pendentives on p. 215.

Another photograph on p. 217 shows the wrought-iron ribs of the groins of the barrel-vaulted ceiling in one of the corridors round the circular court. Similar ribs are used in the other corridors. These are fixed by means of the travelling scaffold, carrying forge, &c., shown on p. 217. The ribs are bent and fixed by smiths on the job, the work being carefully set out on centres by the contractors' general foreman. This work requires great exactitude when it is recollected that the plaster would show up any inaccuracy of outline.

We shall publish further detail views illustrating the work in progress at a later date.



UPPER PART OF WINDOW SECOND STOREY.



NEW GOVERNMENT OFFICES, WHITEHALL: ENTRANCE HALL.

COMBINED DRAINAGE.

Forthcoming Revision of the Law.

By E. B. B. NEWTON, A.M.I.C.E., F.S.I.

AMONG the many matters affecting the interests of the building trades which will be brought under the notice of the public in the near future, few will be of greater interest generally than the question of an amendment of the law relating to combined drainage. There is practically unanimity of opinion as to the necessity for such amendment both in the Metropolitan area and in the provinces, but not as to the form such amendment shall take.

Dealing first with the Metropolis, Bills were drafted by the London County Council in 1897 and 1899, and in the latter case introduced into Parliament, but they had to be withdrawn, principally owing to the fact that, though not Government measures, the proposals in them, if sanctioned, would have had the effect of amending the Metropolis Management Acts, which are public enactments.

Recently the County Council have been asked to prepare a Bill again, but their reply is a suggestion that the various boroughs should agree upon a Bill and then impress its importance upon the Government with a view to the promotion of a Bill as a Government measure.

At the end of June last delegates from twenty-one of the twenty-eight borough councils waited upon the president of the Local Government Board, and his reply to them was certainly of a reassuring character. On February 4th, 1904, to a deputation of the Association of Municipal Corporations representing the provinces as well as London, and of a conference held at Glasgow, he expressed his willingness to deal with the subject if a satisfactory and practically non-controversial remedy could be found.

As a result the Metropolitan councils are moving in the matter, and there can be little doubt that in a short time proposals will be laid before Parliament to amend the existing law on the subject.

What the Present Law is.

The existing law, broadly stated, is that where premises are drained in combination under an order of the local authority or of the late Metropolitan Board of Works the private owner is responsible for the maintenance of the whole system, whereas if two or more premises are drained by a common drain without such an order the local authority is responsible for the portion which receives the drainage of both or all of the premises.

The unfairness of this clause to the general body of ratepayers is manifest, for the local authority is held responsible for drains common to two or more houses, which possibly may have been connected together surreptitiously and without the knowledge of the local authority, who perhaps may have had no opportunity of supervising the original construction of this drain. Moreover, the difficulty to the local authority of looking after such a drain is the more where, as is generally the case, the greater portion of the combined system is on private property; for while the authority doubtless have power to enter such property for the purpose of attending to the combined drain or sewer, when works have to be executed in connection with such a combined drain or sewer there is even under the best of circumstances the extra trouble of serving and obtaining compliance with notices of entry where requisite, and arranging for the convenience of the occupiers and owners, together with the additional difficulties consequent upon the execution of constructive works in confined spaces and awkward situations, while there are contingent liabilities upon the authority as to compensation to the occupiers and owners for incidental damage caused, especially where additional manholes, &c., are desirable but objected to by such owners and occupiers.

Building Over Sewers.

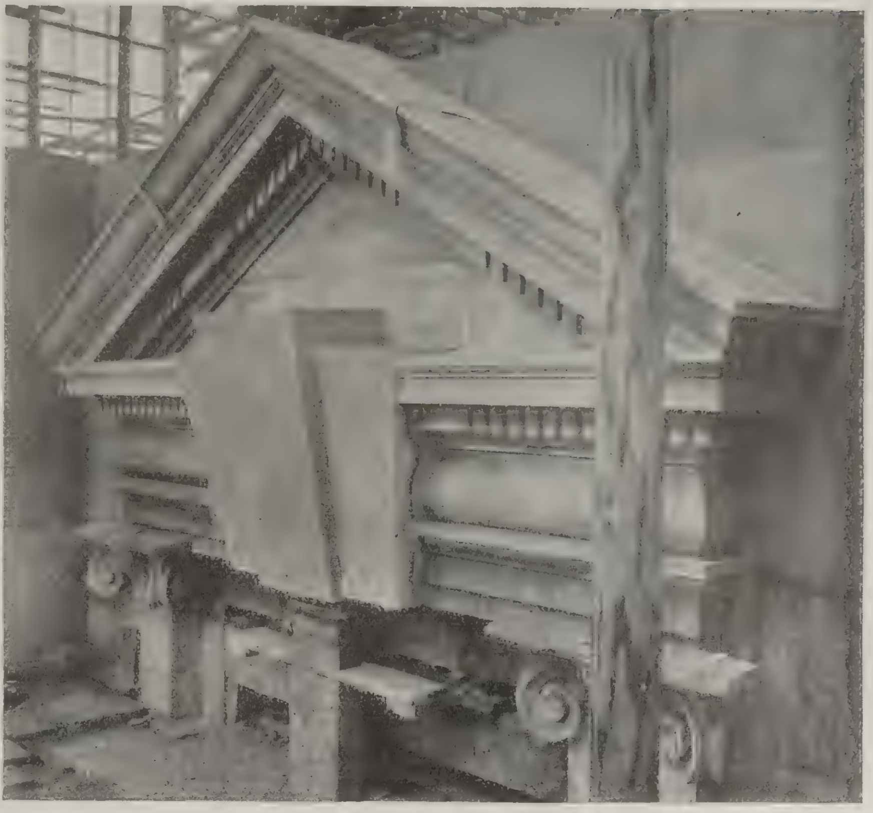
Another point that may cause hardships to property owners is that there are certain restrictions as to building over sewers; and where a common drain has been held to be a sewer, and an owner wishes to extend his premises to such an extent as to build over this sewer, obstacles may arise by reason of a refusal of the local authority to sanction such a construction over an existing sewer.

Again, in some cases there is unfairness to the owner who has originally constructed a combined drain or who has by purchase or demise taken over the liability for the maintenance of such a drain where executed in compliance with an order of the local authority, and so remaining vested in the owner. As is frequently the case in London, between two main streets houses may be constructed with the spaces at the rear of such houses abutting along their entire length. In the initial inception two alternative methods present themselves.

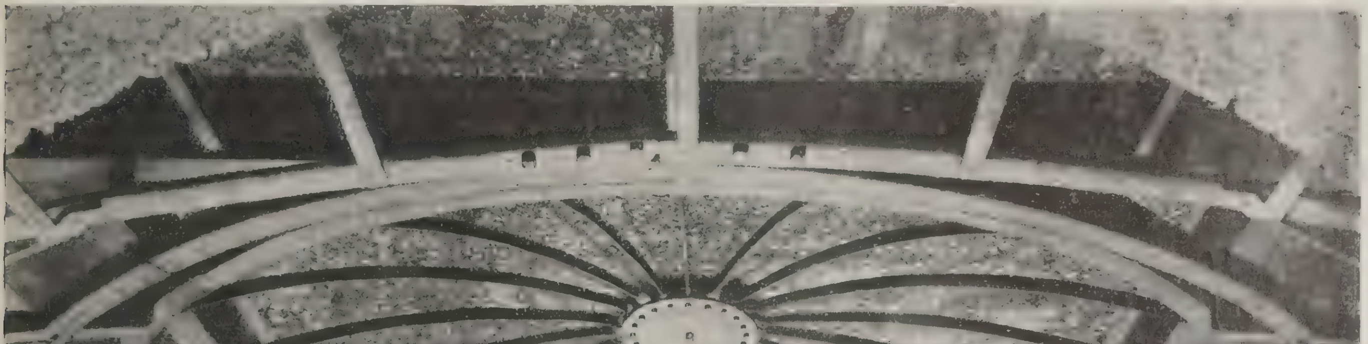
(1) A sewer may be laid along each main street sufficient to take the surface water of the street together with the drainage from all the houses, each house being connected separately to such a sewer.

In this case, if the houses are not detached each drain must pass under the buildings and rooms. After its first construction, in a manner approved by the local authority, the sewer becomes vested in the authority and each drain in the owner of the premises which it serves.

(2) Either no sewer need be laid or in each street a sewer may be laid as before



JPPER PORTION OF WINDOW SECOND STOREY.



NEW GOVERNMENT OFFICES, WHITEHALL: IRON FRAMEWORK FOR CEILING OF ENTRANCE HALL.

sufficient to take the surface water of the street and perhaps also the front positions of the houses. Then in either case a common drain may be laid at the rear of each row of houses and each house separately connected with such common drain.

By this second method drains under houses may be entirely avoided. In fact, under given circumstances this is the only possible way to avoid drains passing under houses; and the by-laws now in force require that no house shall have a drain under it unless any other method of construction is impracticable. From a sanitary point of view the second method is unquestionably the better, though it may not offer to the owner any financial advantage as compared with the first one. Nevertheless, if the work is all performed under the order of the local authority the private owners are individually and collectively liable for the maintenance of the whole drains, together with that of the common drain at the rear of the premises, and possibly of those common drains or sewers in the front, though as a rule the local authority would accept, and be liable for the maintenance as sewers of the common drains or sewers if any are needed and laid under the public streets. If, in the second case, there were constructed a public back street between the rears of the two rows of houses, the common drain at the rear of the premises would be laid along the back street, and the local authority almost certainly would take over the common drain as a sewer. The only difference between the two alternative methods in the second case would be that in one the common drain would be on a part of the private property, while in the other it would be on the public highway. Yet in the first method of the second case the private owner could be held responsible, and in the second method of the second case the public authority for practically the same conduit, save that in the latter case the public would have a right of conducting drains to the sewer, subject only to obtaining the consent of the local authority.

If narrow back streets were legalized in London the difficulty could be easily and equitably met as regards future constructions, and such a course has much to commend it for other reasons than the one particularly referred to here.*

With regard to existing drains, if legislation is to be altered and new regulations of a retrospective character introduced, it would seem desirable that the local authority should

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* A proposition towards this end, was contained in the defunct London Building Acts Amendment Bill, 1905.

NEW GOVERNMENT OFFICES, WHITEHALL: VIEW OF THE CIRCULAR COURT.

be responsible only for such combined drainage systems as had been permitted by their order and carried out under their supervision and to their satisfaction in all respects, while all other systems should be considered to be vested in the owners of the various properties which the drain serves.

Probably the clauses suggested in the London County Bill of 1899 would be found to meet with general approval. They are of course retrospective in character, and read as follows:—

1. In the construction of the Metropolis Management Act, 1855, and the Acts amending the same the word "drain" shall be deemed to apply to and include the subject-matters specified in the interpretation of the word "drain" contained in the 250th section of the Metropolis Management Act, 1855, and in the 112th section of the Metropolis Management Act, 1862, and also any drain the construction of which as a sewer has not been sanctioned by a local authority or which has not been approved as a sewer by the Metropolitan or other Commissioners of Sewers or by the Metropolitan Board of Works or the London County Council.

Provided that the London County Council may at any time approve as a sewer any drain for draining a group or block of houses where in the opinion of the local authority of the district it is desirable that such drains should be cleansed, repaired and maintained at the expense of such local authority, and such drain shall thereupon become a sewer and be vested in such local authority.

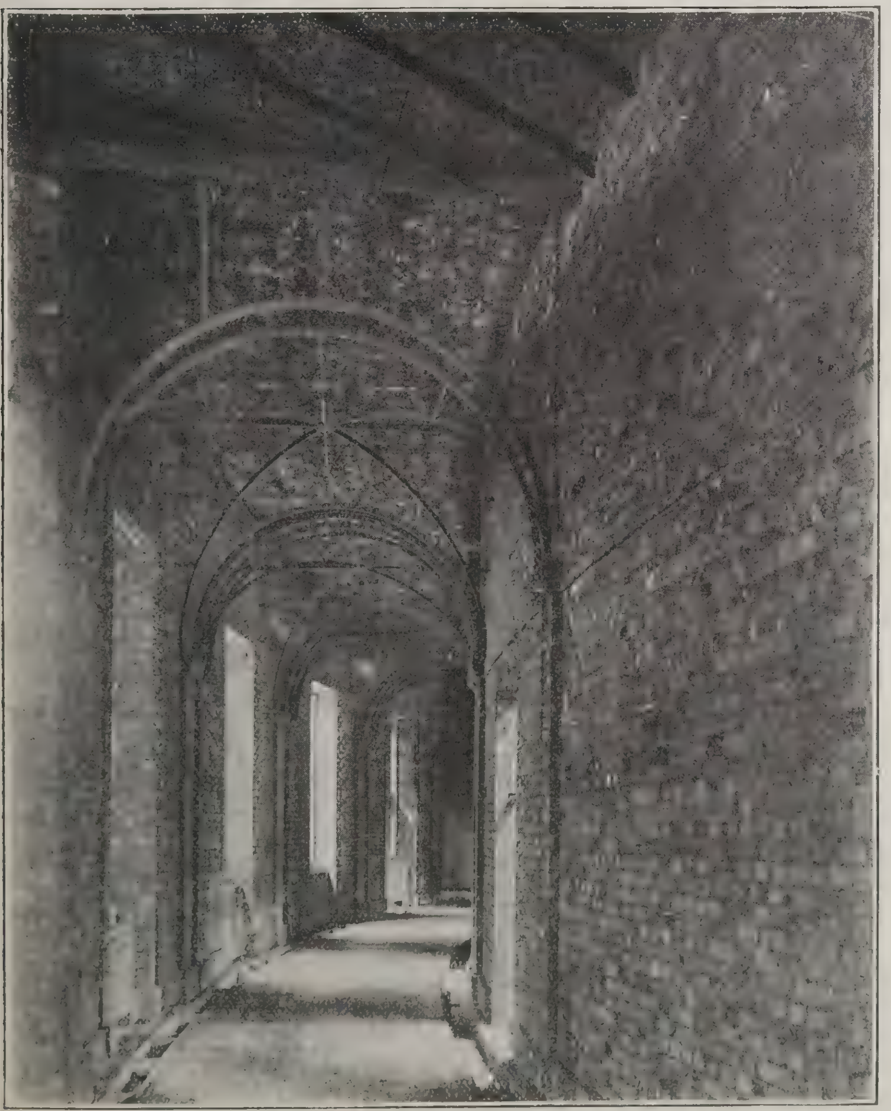
2 Any local authority may recover any expenses incurred by them after the passing of this Act in cleansing, repairing or replacing any drain for draining any group or block of houses from the owner or owners of any premises for the drainage of which such drain is or may be used in such proportions, if there be more than one such owner, as may be determined by the surveyor of the local authority, or in case of dispute by the London County Council.

Any such expenses may be recovered from the present or any future owner of the premises either by act of the High Court or before a court of summary jurisdiction.

4. This Act may be cited as the Metropolis Management Act, 1896, and shall be considered as one with the Metropolis Management Act, 1855, and the Acts amending the same.

In the provinces the law, again, broadly stated, is that where a conduit takes the drainage of more than one premises it is to be deemed a sewer and vested in the local authority. There is no question as to the passing or not of an order by the local authority.

SCAFFOLDING USED BY SMITHS IN ERECTING RIBS.



NEW GOVERNMENT OFFICES: RIBS IN CIRCULAR CORRIDOR.

Where a nuisance arises in a drain common to two or more premises, by section 19 of the Public Health Act, 1890, and under certain conditions, the private owners may be jointly and severally liable for the remedying of such nuisance, and the West Ham Corporation by a special clause (section 42) in their private Act of 1898 have obtained power to deal with common drains as drains for which the private owners are responsible, and apparently have freed themselves in this way from the general liability which rests upon other local authorities. This section reads as follows (section 41 of the Act referred to in it relates to the remedying of defects in drains after inspection by duly authorized officials):

In and for the purpose of section 41 of the Act of 1893 the word "drain" shall be deemed to include any sewer or drain, whether constructed before or after the passing of this Act, with which two or more houses or premises (whether belonging to the same or different owners) are at the date of the passing of this Act or may at any time thereafter be connected or which is used or capable of being or intended to be used for the conveyance of the drainage of such houses or buildings directly or by means of any other sewer or drain to any public sewer situate under a street repairable by the inhabitants at large, but shall not include any sewer which has been constructed to the satisfaction of the Corporation under section 152 of the Public Health Act, 1875, or any sewer which has been constructed by the Corporation for the effectual drainage of the borough.

Though this section 42 undoubtedly relieves the local authority of liability for unauthorised works, it does not appear to fully safeguard the interests of property owned in the directions indicated earlier in this article.

It would seem that a clause drawn upon the lines of that adopted for the London County Council, amended so as to meet the difference between the law in London and in the provinces, would be more equitable and more likely to commend itself to all parties, and so perhaps avoid the keen controversial discussion which the president of the

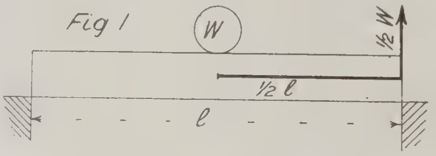
Local Government Board suggests would be inimical to its progress through Parliament.

In a brief article such as this it is impossible to touch upon more than the fringe of this complicated subject, but enough has been mentioned to show generally the main points at issue.

FIBRE STRESS IN BEAMS.

By **HENRY ADAMS, M.I.C.E., &c.**

THERE appears to be a very widely diffused misapprehension regarding one of the components of the ordinary formulæ for the strength of rectangular beams which the writer desires to make clear in the following article. Taking the well-known formula for the strength of a beam supported at the ends and loaded in the centre, viz., $W = \frac{Cbd^2}{L}$, this will be found to be made up from the fundamental equation $\frac{Wl}{4} = f\frac{bd^2}{6}$ where W = breaking weight in cwts. in centre, C = constant or numerical coefficient, b = breadth in inches, d = depth in inches, L = length of span in feet, l = length of span in inches, and f = what is generally called extreme fibre stress. It is to the last quantity that attention must be chiefly directed, but the relationship of the two equations given above must first be explained. By the "principle of the equality of moments" we have the bending moment M = the moment of resistance R. The bending moment is seen from Fig. 1 to be $\frac{1}{2}W \times \frac{1}{2}l = \frac{Wl}{4}$, but the moment of resistance will require more explanation. Let Fig. 2 be taken as a cross-section of the beam to a larger scale, with the neutral axis or layer passing through the centre of gravity of the section. Then, under the given conditions of loading, the upper half will be in compression and the lower half in tension. The stresses will, however, not be uniform throughout the depth; the fibres nearest to the top and bottom edges will be strained the most, and the effect will be less as the distance from the edge increases, until at the neutral layer the effect, so far as longitudinal stress is concerned, entirely disappears. Action and reaction are always equal, so that it comes to the same thing whether we think of the fibres as being strained by the load according to their distance from the neutral axis, or that according to their distance from the neutral axis the fibres are in a better position to resist the effect of the load. The latter view gives the better idea of resistance. Now, instead of supposing all the fibres to be in action with varying amounts of resistance according to their distance from the neutral axis, we may imagine only a certain number of the fibres acting, but all those selected fibres acting with the maximum effect to produce an equal total resistance. Thus, by drawing diagonals in Fig. 2, and shading the upper and lower triangles, we may look upon the shaded portions as representing those fibres that would be doing the whole work of resistance, the others being inoperative. These shaded portions are called the "inertia areas," acting as a "couple" in the reverse direction to the bending moment. The measure of a couple is one of the forces multiplied by the arm or distance between the forces; therefore the couple in this case, representing the moment of resistance, will be the area of one of the shaded triangles $= \frac{bd}{4}$, multiplied by the "fibre stress" $= f$, and multiplied also by the arm or distance between the centres of gravity of the shaded triangles $= \frac{2}{3}d$, that is, $f\frac{bd}{4} \times \frac{2}{3}d = f\frac{bd^2}{6}$. The fraction $\frac{bd^2}{6}$ is the measure of the resistance of the section due to its size and shape, and is known as the "modulus of section" $= Z$, also improperly called by some writers "the moment of resistance in square inches." The modulus of section is also called the "strength modulus," but this is hardly correct, because it is independent of the material and therefore of one of the chief elements of strength, and is solely a function of size and shape. The combination of the two couples producing equilibrium is shown in Fig. 3. The first equation given above is derived from the second one, thus: $l = 12L$, then $\frac{W12L}{4} = f\frac{bd^2}{6}$, or $W = f\frac{bd^2}{6} \div \frac{12L}{4} = \frac{4fbd^2}{6 \times 12L} = \frac{fbd^2}{18L}$; but $\frac{fbd^2}{18L} = \frac{Cbd^2}{L}$ $\therefore C = \frac{f}{18}$. Now, to take a practical example, cast-iron has an ultimate tensile strength of, say, 140 cwts. per sq. in. and an ultimate compressive strength of 840 cwts. per sq. in.; therefore, assuming the neutral axis to remain at the centre of gravity of the section up to the point of fracture, the fracture would take place when the extreme fibre stress reached 140 cwts. per sq. in.; then if f is the ultimate fibre stress, $f = 140$ and $\therefore C = \frac{140}{18} = 7{\cdot}7\dot{7}$; but by experiment a cast-iron bar 1in. broad and 1in. deep, 1ft. between the supports, breaks with a load of 20 cwts. (1 ton) in the centre, and as $W = \frac{Cbd^2}{L}$ $\therefore C = 20$. An explanation may be attempted by assuming that the neutral axis shifts until the inertia area on the tension side multiplied by the tensile strength is equal to the inertia area on the compression side multiplied by the compressive strength. To find this position of neutral axis $\frac{1}{2}(xbd) \times 840 \times \frac{2}{3}(xd) = \frac{1}{2}(ybd) \times 140 \times \frac{2}{3}(yd)$, or $280xbd^2 = 46\frac{2}{3}ybd^2$, or $280x = 46\frac{2}{3}y$; but $x + y = d$, $\therefore x = d - y$ and $y = d - x$, then $280x = 46\frac{2}{3}(d - x)$, whence $280x + 46\frac{2}{3}x = 46\frac{2}{3}d$, or $326\frac{2}{3}x = 46\frac{2}{3}d$; divide both side by $46\frac{2}{3}$, then $7x = d$, or $x = \frac{1}{7}d$. This may be found graphically by a very simple means. Upon a piece of the elevation (Fig. 4) set up a vertical line A B C equal in any scale to the compressive and tensile resistances as shown; join the extremity C with any point on the base as D; where this line cuts the upper edge at E draw another vertical; join B D, and where it cuts the vertical below E in point F we shall have the position of neutral layer, which will be $\frac{140}{840 + 140} = \frac{1}{7}d$ below the top. Transfer this to Fig. 5, and then we have the amount of resistance $= \frac{1}{2}(\frac{1}{7}bd) \times 840 \times \frac{2}{3}(\frac{1}{7}d) + \frac{1}{2}(\frac{6}{7}bd) \times 140 \times \frac{2}{3}(\frac{6}{7}d) = 40bd^2$. Returning to the fundamental equation $\frac{Wl}{4} = f\frac{bd^2}{6}$, then $\frac{fbd^2}{6}$ must equal $40bd^2$, or $\frac{f}{6} = 40$, whence $f = 240$. But C has been shown to be $= \frac{f}{18}$, therefore $C = \frac{240}{18} = 13\frac{1}{3}$ after allowing for the full tensile and compressive resistance on the assumption of "fibre stress," whereas experiment shows $C = 20$. Professor Rankine found the same difficulty in comparing the transverse strength of a material with its resistance to compression and tension. He says in his "Applied Mechanics," p. 316: "When the *breaking* load is in question, the coefficient f is what is called the *modulus of rupture* of the material. It does not always agree with the resistance of the same material to direct crushing or direct tearing, but has a special value, which can be found by experiments on cross-breaking only." And in a footnote on p. 634 he says: "The modulus of rupture is eighteen times the load which is required to break a bar of 1 in. sq., supported at two points 1ft. apart, and loaded in the middle between the points of supports." This would make $\frac{Wl}{4} \neq \frac{18bd^2}{6}$ for cast-iron in tons, or in cwts. $\frac{Wl}{4} = \frac{18 \times 20bd^2}{6}$, whence $W = \frac{18 \times 20 \times 4 \times bd^2}{6 \times l} = 240\frac{bd^2}{l}$, or if L be used $= \frac{240bd^2}{12L} = \frac{20bd^2}{L}$, agreeing with the experiment. Reviewing the above statements and figures, we see that whereas the common interpretation of the formulæ as based upon extreme fibre stress would give a factor of $13\frac{1}{3}$ for C, in the case of a cast-iron beam it is actually 20, and therefore a beam designed for a maximum fibre stress equal to the working stress in direct tension or compression will probably be much stronger than it is supposed to be.



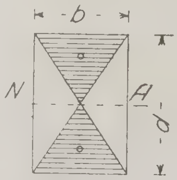
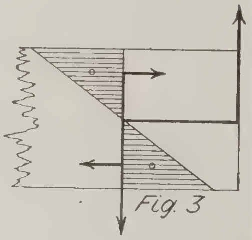
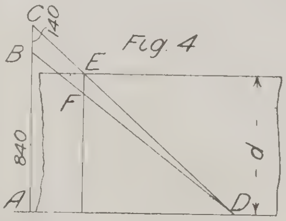
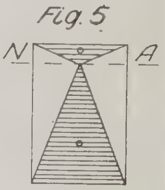


Fig 2







A Roman Catholic Church is to be built in the grounds of Lady Bute's Orphanage at Rothesay, at a cost of between £30,000 and £40,000. Accommodation will be provided for 1,000 persons. Mr. R. Weir Schultz, of London, is the architect.

The Organ at Hexham Abbey is to be reconstructed by Messrs. Norman & Beard at a cost of £2,000. As much as possible of the old instrument will be incorporated with the new work. The echo organ will be placed in the south transept triforium.

Wakefield Cathedral Spire.—About 10ft. of the spire of Wakefield Cathedral has to be rebuilt, one of the stones having been found to be cracked. The work is now in progress, and in connection with it an interesting "find" has been made. In the vane of the weathercock was a receptacle of hammered copper, the ends of which were sealed, containing ancient records as to the spire. From these it appears that the spire was partly rebuilt and repaired in 1715, that the tower and spire were repaired in 1803, that the upper part of the spire was rebuilt in 1823 (when it was raised to its original height, having been diminished in 1715), and that the tower and spire were again restored in 1861. These records have been supplemented by a statement with reference to the repairs that are now being made, and the box will once more be placed in its original repository. The total height is 247ft.

THE INTERNATIONAL BUILDING TRADES' EXHIBITION.

THE sixth International Building Trades' Exhibition which is to be opened to-morrow at the Royal Agricultural Hall, Islington, by Lord Windsor, First Commissioner of Works, promises to be the best which has yet been held. The exhibits are more numerous than before—there being about three hundred exhibitors—and they are thoroughly representative of all the building trades. The merits and advantages of this exhibition are now fully appreciated, and it is visited not only by builders, architects, surveyors and others in their private interests, but also by the trade and professional societies in their official capacity. To have thus brought together all the chief building materials and appliances on the market is of the greatest value, especially as regards the new systems of construction and novelties which are constantly being introduced; here they can be thoroughly inspected and compared, enabling architects and builders to keep in touch with all the most up-to-date innovations.

This year there is no special section in the Exhibition, but particular prominence is given to fire-resisting construction—so much to the front at the present time. By making forward arrangements we are able to give our readers an illustrated account of the chief exhibits, which we have gathered together, as far as possible, under sectional heads. In our next issue we shall complete our description of the Exhibition.

BRICKS, ROOFING TILES, &c.

The foremost importance of the materials in this division of building construction is apparent to everyone, and though the attention of visitors is not claimed by such startling novelties as are found in other trades it will be more soberly given by large users. Below will be found more particular reference to noteworthy exhibits, and here we may simply call attention to a few facts worthy of consideration. A new and very cheap glazed brick has been placed on the market by the Gildenburg Brick Co. The Selby Brick Co. is showing glazed faïence bricks, which add to the advantages of faïence decoration that of constructional treatment, with stability and saving in cost of rendering, floating and fixing as with tiles. The Wrotham hand-made red bricks and roofing tiles have a rich dark colour naturally obtained, and have secured a deservedly high reputation among architects. Messrs. Carter & Co., of Poole, have an attractive stand constructed of grey terra-cotta with vases, glazed dadoes, tile floor, &c., accessories, where they display their goods to advantage. Messrs. Watson Nelson, Ltd., possess at their works near Rugby a stiff-plastic clay which burns a brilliant red colour and gives their bricks, &c., distinction, while a layer of a kind of ironstone marl burns very red and makes a good roofing ile called the "Windmill" brand. The Nostell Brick and Tile Works are showing . finely-coloured dark-red machine-made oofing tile. Messrs. H. J. & C. Major's interlocking tiles are now well known, but preserve their interest to many persons. As o clayworking machinery, Mr. F. A. Smith is howing several cheap brick- and tile-making machines that are simple, compact and trong in construction—the governing factors in the life, efficiency and economical working f the plant.

Hand-made Bricks and Roofing Tiles.

Stand No. 113, Row F.

The red facing bricks and roofing tiles hown by Messrs. Thomas Pascall & Sons, whose chief office is at High Street, outh Norwood, are entirely hand-made; with the exception of the clay-grinding mills, no machinery of any kind is used in their production. They are of a very rich ark colour—especially the roofing tiles—nd it is worthy of note that this is quite atural, no staining or artificial means being resorted to. Messrs. Pascall make most of their goods from April to September, but ave artificially-heated drying sheds to nable them to meet special orders throughout the winter. The prices of the bricks range from 45s. to 50s. per thousand on rail, and the tiles from 40s. to 45s. At the works there is every facility for loading, the rm possessing a private siding on the . E. & C. Rly., and a mile of permanent railway extending in various directions in the works, enabling the railway trucks to be brought right up to the kilns, thus saving the repeated handling to which the goods would be subjected if they had to be carted to the railway. The private line also runs down into the sandpits, where a building sand of good quality is dug. Messrs. Pascall also make flower pots and chimney-pots, &c. Their works are at Wrotham in Kent and at Elmer's End, Beckenham. The phrase "Wrotham red" among sand-faced tiles is becoming as well known as "Broseley" among machine-made tiles. The works at Elmer's End are only concerned in the making of London stock bricks.

Enamelled Bricks, &c.

Special position No. 9, Row D.

Messrs. Stanley Brothers, Ltd., of Nuneaton, are chiefly exhibiting this year enamelled bricks, a speciality in coloured pots and ridges, and a sink combination consisting of sink, sink standards and sink trap fittings with sink and bath trough. This firm's glazed bricks have a deserved reputation for richness of colour and evenness of glaze, while their designs for glazed ware betray careful thought and appreciation of conditions. Their works are able to turn out large quantities of bricks, while an extensive stock is kept in hand to meet all possible requirements.

Selby Faience Bricks.

Stand No. 116, Row F.

Various examples of Selby glazed faïence bricks are shown by the Selby Brick Co., Ltd., of Peterborough. These bricks are manufactured by an entirely new method, and combine all the best features of faïence tile decoration with the advantages of constructional treatment. Walls faced with them are finished as laid, so that the cost of rendering, floating and fixing is saved. The richness of texture and wide range of colours have already received very favourable notice.

Firebricks and Stable Paving.

Stand No. 108, Row F.

Messrs. Towers & Williamson, of Little Bytham, Grantham, make a special feature of firebricks and stable paving. The clay used is of a very refractory nature and withstands high temperatures. The bed has running through it a seam of silicate rock, from which the firm supplies ganister.

A Richly-coloured Roofing Tile.

Stand No. 88A, Row E.

The Nostell Brick and Tile Works, near Wakefield, are making a special feature of roofing tiles. These are deep-red in colour (purple-brown would, perhaps, be the nearest description) and look well on a roof, as visitors may have a chance of judging at the stand of the British Compoboard Co., Ltd., in Row F, No. 5, the roof of which is covered with the Nostell tiles. Special care is taken in the manufacture to avoid lamination (the point in which many manufacturers fail), and the vitrification is thoroughly done. Finials, &c., are also exhibited, while the firm's blue and brindle bricks for paving and building purposes and ornamental and plain double-pressed bricks are deserving of notice.

Interlocking Tiles.

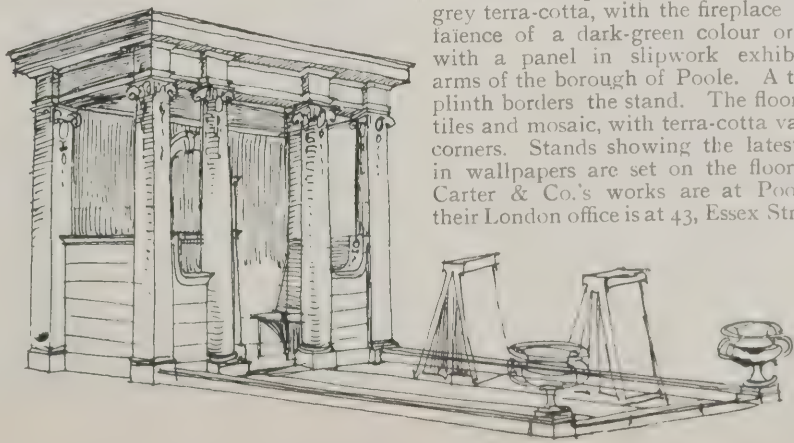
Stand No. 92, Row E.

Messrs. H. J. & C. Major, Ltd., of Bridgwater, are exhibiting their well-known tiles, namely, their patent interlocking tiles of plain, Roman and Welbeck patterns, with suitable ridge tiles, and a variety of ordinary pattern tiles with ridge tiles and finials. The interlocking tiles are designed to be proof against weather; they require no nails nor mortar or cement to fix them. In addition to the important exhibit of tiles, the firm is also showing oven, paving and malt-kiln tiles, building bricks, land drain pipes, &c.

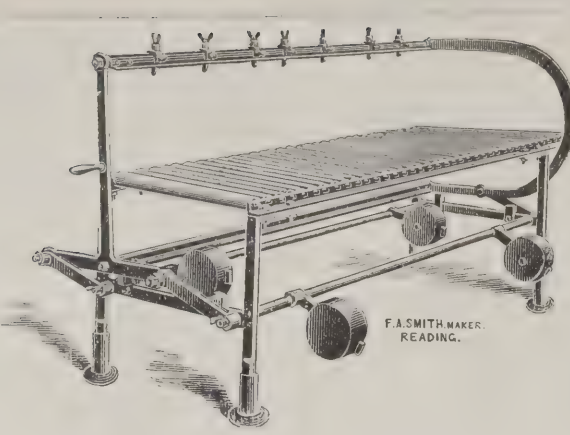
Architectural Terra-cotta.

Stand No. 96, Row E.

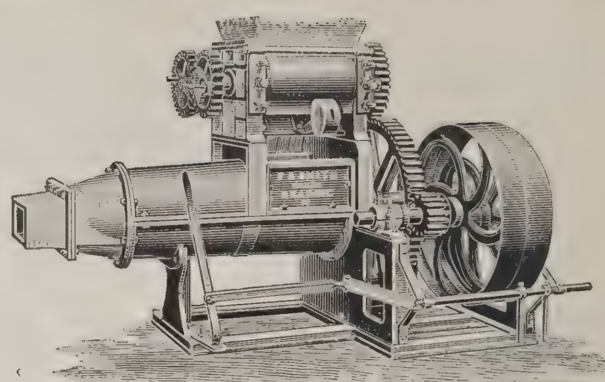
As the illustration below indicates, this is a very attractive stand, exhibiting good architectural quality. It is constructed of grey terra-cotta, with the fireplace in glazed faïence of a dark-green colour ornamented with a panel in slipwork exhibiting the arms of the borough of Poole. A terra-cotta plinth borders the stand. The floor is in red tiles and mosaic, with terra-cotta vases at the corners. Stands showing the latest patterns in wallpapers are set on the floor. Messrs. Carter & Co.'s works are at Poole, while their London office is at 43, Essex Street, W.C.



MESSRS. CARTER & CO.'S STAND.



CUTTING-OFF TABLE FOR TILES.



THREE-PROCESS AUGER BRICK MACHINE.

Clay-working Machinery.

Bay 16.

We illustrate two of the exhibits of clay-working machinery at the stand of Mr. F. A. Smith, of Kennet Iron Works, De Bohun Road, Vastern Road, Reading. The three-process brick machine is strong and serviceable in design, and is specially designed to meet the requirements of plastic clays. A 6-h.p. engine is required to drive it, and it has a capacity of from 8,000 to 10,000 bricks per day. The diameter of the rolls is 12ins. and the width 17ins., the diameter of belt pulley 2ft. 10ins., width 5ins., and it runs at a speed of 80 revolutions per minute. Its compactness is noteworthy; the amount of floor space occupied is 8ft. 3ins. by 4ft. 9ins., and the nett weight is approximately 2½ tons. Two new Auger type brick machines are shown, No. "0" and No. "4" sizes. The first or Colonial type has been designed for very small yards abroad or for making fancy ware. It is cheap, strong and occupies little floor space, namely, 7ft. by 3ft. 6ins. Its capacity is about 4,000 bricks per day, and it can be driven by a 4-h.p. engine. The No. 4 machine has been specially designed to deal with the stiffest plastic clays. Mr. Smith also exhibits an interesting tile and pipe machine fitted with die for ordinary roofing tiles which can easily be replaced with plain pipe dies. The cutting-off table for tiles here illustrated is well balanced, cuts evenly through pipes or tiles, and is strongly made of wrought-iron and steel throughout. The floor space occupied is 7ft. by 3ft. and the weight 2 cwts. A cutting-off table for bricks is also exhibited.

Adamantine Paving Quarries.

Stand No. 85, Row E.

Nothing new is exhibited by Messrs. Watson, Nelson, Ltd., of Napton-on-the-Hill, near Rugby, except their adamantine paving quarries. The rest of the exhibit consists of roofing tiles, ridges, finials and bricks. It may be noted that the ground whence the firm derive their material has a top layer of a stiff-plastic clay which burns a very brilliant red colour; then a layer of a kind of ironstone marl, which also burns very red, and is chiefly used for making the "Windmill" brand roofing tile; and then a blue shale from which good blue bricks are made.

A Granite and Cement Paving Slab.

Stand No. 84, Row E.

The chief exhibit of the Atlas Stone Co., Ltd, of Coldhams Lane, Cambridge, is the Atlas "Foothold" paving slab, made under hydraulic pressure from Leicestershire granite and the "Saxon" brand of Portland cement. A Faijas testing machine is provided to test briquettes made from this cement used for Atlas "Foothold" slabs. Another exhibit is an armoured cover for electric-light joint boxes, designed to take a distributed load of 5 tons. This has expanded steel embedded in the stone, and dispenses with the usual cast-iron frame.

Roofing Tiles.

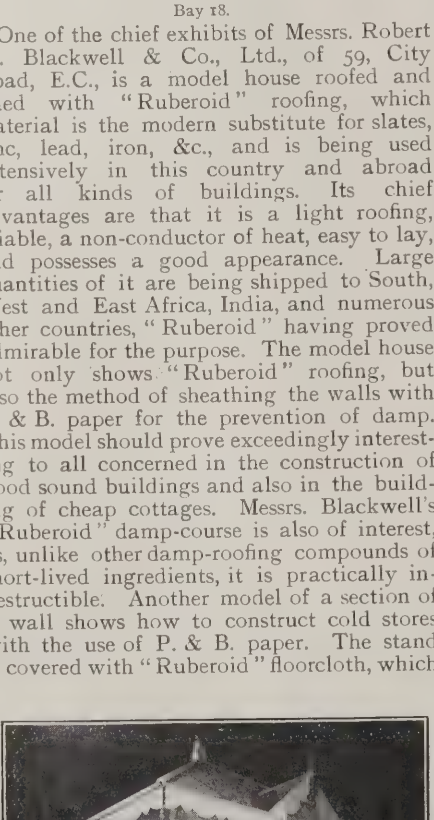
Stand No. 83, Row E.

A fine show of roofing tiles in many varieties of colour and surface, as well as finials and terra-cotta generally, is to be seen at the stand of Messrs. S. & E. Collier, Ltd., of Reading. This firm is offering a very cheap line in machine-made terra-cotta. Sand-lime bricks in various colours are also a speciality, and an artificial stone with an excellent surface is likewise worthy of attention. Coloured cement flooring tiles at very reasonable prices are another speciality of the firm. King's patent imitation gauged arches are shown. These are made of the noted Reading rubbing clay, but entail no expense in rubbing down to size.

Ruberoid Roofing.

Bay 18.

One of the chief exhibits of Messrs. Robert W. Blackwell & Co., Ltd., of 59, City Road, E.C., is a model house roofed and sided with "Ruberoid" roofing, which material is the modern substitute for slates, zinc, lead, iron, &c., and is being used extensively in this country and abroad for all kinds of buildings. Its chief advantages are that it is a light roofing, pliable, a non-conductor of heat, easy to lay, and possesses a good appearance. Large quantities of it are being shipped to South, West and East Africa, India, and numerous other countries, "Ruberoid" having proved admirable for the purpose. The model house not only shows "Ruberoid" roofing, but also the method of sheathing the walls with P. & B. paper for the prevention of damp. This model should prove exceedingly interesting to all concerned in the construction of good sound buildings and also in the building of cheap cottages. Messrs. Blackwell's "Ruberoid" damp-course is also of interest, as, unlike other damp-roofing compounds of short-lived ingredients, it is practically indestructible. Another model of a section of a wall shows how to construct cold stores with the use of P. & B. paper. The stand is covered with "Ruberoid" floorcloth, which is very durable and requires no nailing to the floor, being simply laid down. Messrs. Blackwell's City Road offices have been covered with this material for the last six years. At the Brussels International Exhibition of 1897, in the British section, the floors were covered with "Ruberoid" and millions of people walked on it; a sample piece is shown at the stand. Messrs. Blackwell also show "P. & B." paints for wood and iron (which are unaffected by lime, cement, mortar or earth gases) and numerous valves, pipes, fittings, tools, pumps, radiators, ventilators, &c. The



MESSRS. BLACKWELL AND CO.'S STAND.

Contractors' Hand-pumps

exhibited have a capacity of 3,000 gallons per hour. The "Diaphragm" pump has a 12½in. rubber diaphragm, which is used in the place of a pump bucket. These will discharge semi-liquids containing sand, gravel, &c., from sewers, excavations, trenches, &c., without choking, and are easily worked by one man. Another pump is the "Cataract" flood pump, which is capable of lifting up to 26ft. and is adapted for draining ponds, cesspools, &c. This pump is shown in operation pumping water from a tank made with 3-ply "Ruberoid" roofing; the tank has one joint at the bottom, so that while proving its waterproof qualities it shows that it will bear the weight of water without breaking joint.

Vulcanite.

Stand No. 45, Row B.

A small model house showing the application of patent Vulcanite roofing to a roof of wood construction—which roofing can also be used for roofs of concrete construction—is exhibited by Messrs. Vulcanite, Ltd., of 18, Cannon Street, E.C. Vulcanite sheet asphalts for roofing, sarking and damp-course are also shown, as well as the firm's new Vulcanite rubber paint, rubber enamel, varnishes, &c., and ready mixed paint.

Concrete, Stone and Mosaic Work; Wood-block Flooring.

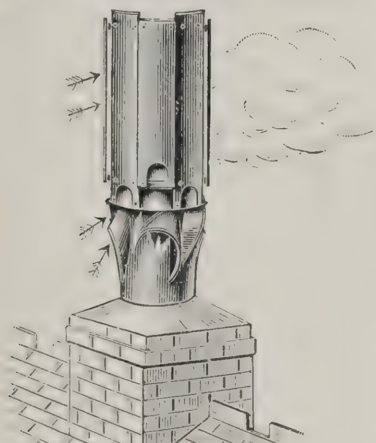
Stand No. 78, Row D.

Work in concrete and mosaic, and wood-block flooring, form the exhibit of Messrs. B. Ward & Co., Ltd., of 38 and 39, Parliament Street, S.W., and Grosvenor Works, Bedford. The granite concrete paving shown is laid *i* *situ* in thicknesses varying from 1in. to 4ins. It is jointless, sanitary and very durable and it can be rapidly laid by the firm' experienced layers with the necessary fall for draining with a grooved and channelle or plain surface; the builder providing an laying a 4in. bed of broken bricks or concret as foundation for the paving. Messrs. Ward' reinforced concrete floors and partitions ar designed to give the maximum of strengt with the minimum of steelwork, and ar executed *in situ* on the firm's own system o centering. Artificial stone staircases ma be executed *in situ* or cast at the firm works and delivered to the job ready for th builder to fix, with plain or moulded nosing and with or without Ward's patent non slipping lead treads—effecting a great savin on natural stone and securing greater durability. Mosaic staircases with terrazzo mosaic finish in colours are a speciality of the firm; these also have non-slipping leaded treads, as recently executed by Messrs. Ward at the Baltic Shipping Exchange, St. Mary Axe; Temple Bar and Thanet House, Fleet Street; the Westminster Town Hall and numerous other buildings. The leaded treads are made in the form of a lead grid embedded in the treads; they are neat in appearance, pleasant to walk upon, cannot work loose, and finishing flush with the tread have no sunk or raised portions to collect dirt. Messrs. Ward also exhibit artificial stone dressings of various designs and finished in best style; Roman marble mosaic paving laid with finest finish with the hardest and most durable marbles; terrazzo marble mosaic paving (as now being laid at the University Hospital, Gower Street; the Royal Waterloo Hospital, and the Cancer Hospital, Brompton Road); mosaic hearths, fire-kerbs and mantelpieces; and wood-block flooring. Messrs. Ward are the sole proprietors and manufacturers of Charteris & Longley's patent wood-block flooring, all blocks being dried by a special process before delivery and being laid in special mastic composition.

A New Chimney Cowl.

Stand No. 23 Gallery.

Chimney cowls and sash-fasteners are perhaps the most patented articles used in the building trade; and both of them have got into disrepute by reason of the inefficient and cranky ideas elaborated by amateurs. There can be no doubt, however, that a good chimney cowl is a great desideratum. Most cowls are based on the idea that by revolving over the mouth of the chimney they cause an updraught: that idea, however, has proved to be often fallacious, as some of these revolving cowls have actually impeded, not helped, the draught. Taking the fixed cowl, therefore, as a standard, Mr. E. G. Wright, of Guilford, has introduced his patent twentieth-century "King" chimney cowl, which has been used on numerous Government establishments and important public buildings. We give above an illustration of it, by which the general arrangement can be seen at a glance. This cowl can be swept as easily as an ordinary chimney and cannot interfere with the sweep's brush. It is made of the best galvanized steel sheet, painted with iron paint, and is so formed as to cause an updraught in any quarter of the wind. The price is 50s.


The "King" Chimney Cowl.

Cloisonne Glass.

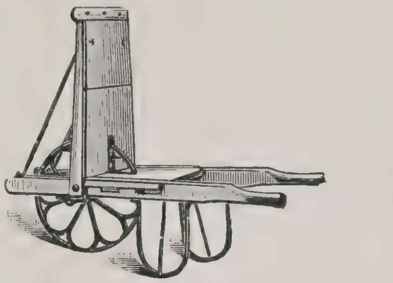
Stand No. 58, Row C.

The Cloisonne Glass Co., of 9, Berners Street, Oxford Street, W., exhibit specimens of their Cloisonne glass suitable for windows, ceiling lights, fanlights and lantern lights, partitions, and any other position where stained or leaded glass may be required. This year they are making a special feature of landscape and figure-work, and exhibit some big pieces, including one of a lady on a white palfrey under an archway: this is 7ft. 6ins. high by 4ft. wide, and is executed on a single sheet of plate glass. In addition, there are shown a number of ready articles that can be used for decoration of rooms, &c., such as electric lanterns fitted with Cloisonne glass, fire screens, threefold screens and tables. These last are not supposed to interest architects, but they all show designs that might be used for house-work, and, being framed, are safer and show to better advantage than when made up in rough sheets only.

Barrows and Tip-wagons.

Stand No. 11, Minor Hall.

Various kinds of barrows and tip-wagons are shown by Messrs. Rowland Brothers, of Fenny Stratford, Bletchley. We illustrate one of them—a crowding barrow, strong and simple in construction and very useful on building works. An entrance gate and a length or two of fencing are also shown at this stand.


Crowding Barrow by Rowland Brothers.

Glazing without Putty.

Stand No. 98, Row E.

The chief exhibit of Messrs. Sam Deards, Ltd., of 34, Old Broad Street, E.C., is their patent "Superior" glazing system, the special claims for which are its simplicity in method and the shape of the section, combined with the fact that any handy-man can fix the glazing bars; with builders this is of the utmost importance, as the smallest contracts can thus be carried out at a minimum of cost, and the builder can supply his own glass and be sure of obtaining a thoroughly water-tight roof. The bar allows for expansion and contraction, without breakage, there being no nuts, bolts, asbestos or packing of any kind, nor any hard metal caps. The bar is made in four sections to carry up to 11ft. glass. The roof can always be got at for repairs, as the web of the glazing bar will support planks and carry workmen, thus enabling repairs, painting, &c., to be carried out without danger of breaking the glass. With some systems this is quite impossible, as they have no support above the glass level. Messrs. Deards draw special attention to the fact that, after severe examination and test, they were awarded the contract for glazing the new steam factory at Portsmouth Dockyard, where the work covered 102,000ft. super.

Iron Shop Fronts; Collapsible Gates.

Stand No. 47, Row B.

Messrs. H. & F. Bonten, Ltd., of 8, Elder Street, Norton Folgate, London E., are making a special feature of wrought-iron projecting shop fronts built up with new sections specially rolled for the purpose, and a new collapsible gate with overlapping ornamentation rolled on the channels in one piece. The exhibit also includes a great variety of ornaments worked from plain and ornamental moulded bars.

Ventilating and Heating Appliances.

Wall Space 145.

Messrs. James Keith & Blackman Co., Ltd., of 27, Farringdon Avenue, E.C., have a fourfold exhibit of warming, ventilating, lighting and hydraulics. They show a chamber set apart for the purpose of practically demonstrating their method of supplying hot and cold air in proportionate quantities (or either separate) to buildings, &c. This comprises a hot-water boiler serving a battery of radiators, with Blackman fans, regulating valves, &c. The Keith patent hot-water boilers shown are both for warming buildings and domestic hot-water supply to washhouses, kitchens, &c. The radiators are of the well-known "Aiolian" and "Universal" patterns. In the ventilating section Blackman fans of various sizes are exhibited, some fitted with pulleys for belt-driving and others having electric motors wound for continuous and alternating currents. Intensified gas lighting, suitable for all classes of buildings, is shown, including Keith's gas compressors, driven by water, electric motor or other motive power. A cellar pump for the removal of water in low-lying cellars, basements, &c., invites attention, as also a ram for raising water in rural districts to any desired level.

PAINTS.

The exhibits of paint manufacturers are important. The subject of paints and painting is far too much neglected. Of late years washable distemper or water paints have come to the fore in no unmistakable way. They give a dull texture of surface and beauty of durable colour in a variety of tints. Enamels, too, are now largely used with excellent effect, while preservative paints are of primary importance in the life of a metal structure.

An Excellent Washable Distemper.

Gallery Bay No. 31.

At the stand of Messrs. W. Carson & Sons, of Grove Works, Battersea, London, S.W., there is an important display of this old-established firm's well-known specialities—their paints, colours, varnishes, enamels and water paint (Muraline). This last-named is entitled to a front place among this class of latterly so popular paints. It possesses many advantageous features, among which we may mention that (1) it is prepared in a dry powder which will not deteriorate if kept dry (thus purchasers do not pay for water, as in the paste or liquid distempers); (2) it is non-poisonous and does not contain lead, arsenic or copper; (3) it is a disinfectant and is inodorous; (4) it contains no glue and is fire-resisting; (5) it is washable when dry and can be immediately second-coated, so that a room can be finished with two or more coats in one day; (6) the colours are fast to light and unaffected by gases, and resist lime; (7) removal is unnecessary before repainting; (8) the cost is one-third that of oil paint; (9) it is superior to ordinary distemper in covering power; (10) it works and flows easily under the brush; and (11) intermediate shades can be produced by mixing various colours or by reducing with white.

Special Paints.

Among Messrs. Carson's other exhibits are "Vitrolite," a paint specially manufactured for the protection of conservatories, forcing houses and all horticultural buildings; their well-known anti-corrosion paint (which was used for painting the Forth Bridge at the time of its erection); special oil mixtures; and an enamel oil mixture for use with the final coat of any paint (an improvement on a mixture of linseed oil and turpentine); non-poisonous liquid paint; varnish woodstains, which are an improvement on the old-fashioned water stains in not requiring sizing and varnishing; "Plastine," a plastic durable glazing composition; and a solution for damp walls.

Hall's Distemper.

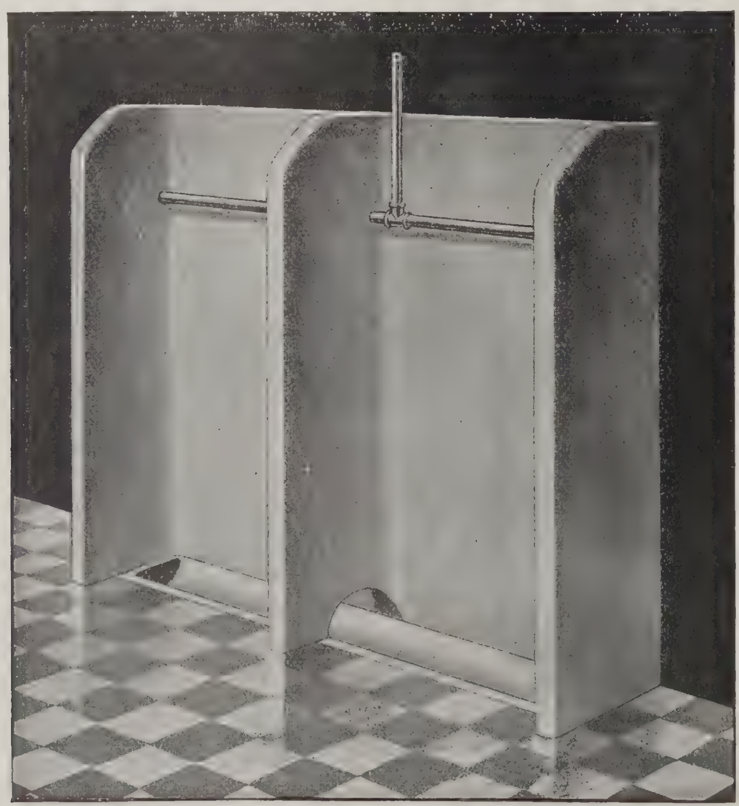
Stand No. 87, Row E.

This stand is a commodious one, 20ft. long by 10ft. wide, the object being to show a large room decorated with the chief manufactures of Messrs. Sissons Brothers & Co., namely, Hall's distemper and "Sisco" White Japan. The inside is fitted up as a modern drawing-room, treated in the simple and inexpensive manner in which Hall's distemper is so applicable. A fireplace faces the entrance to the stand, with window seats recessed to right and left. Above these seats on either side are plain leaded lights, which enable the interior of the stand to be viewed by passers-by on that side. The walls are decorated in Hall's distemper of a delicate heliotrope shade (pattern No. 61 in their shade book). A picture rail, skirting and panelling show the brilliant, hard and lustrous surface of their white enamel. The frieze is treated in stencil with a design of tree decoration incorporating several colours of distemper so as to emphasize how easily this material lends itself to the rapid and effective manipulation of even the most elaborate designs in stencil work. Extending along the whole length of the outside of the stand is a frieze treated with plaster festoons distempered white on a delicate cream background: the lower walls being also coloured with Hall's distemper of a green shade. The walls on the left side of the stand are covered with art canvas coated with Hall's distemper of a buff shade, and a rich frieze 2ft. deep extends from left to right. The subject of the frieze is a landscape, painted on canvas with distemper in varied colours. This side of the stand is an example of the work that can be done with distemper in houses where expense is not an immediate consideration. The stand has eight columns 13ft. high, each projecting 3ft. above the level of the structure. The whole of the woodwork outside is treated with "Sisco" White Japan.

Sanitary Novelties.

Bay 17.

Amongst the exhibits of Messrs. Adamsez, Ltd., of Scotswood-on-Tyne, will be found the following examples of a few of their specialities:—(1) A patent swing lavatory and closet combination, a unique arrangement by which one waste and supply suffices for both lavatory and closet, while a mimimum amount of room is taken up; this arrangement may also be applied to a bath. (2) A pneumatic closet set with the cistern actuated by a small bellows behind the push knob, one of the main features of this set being silence in action. (3) A school washing trough, which ensures clean water for each user, combined with greater economy in water consumption. (4) A "Titanite" lavatory, designed expressly for school purposes; these lavatories are supplied with horizontal or vertical waste pipes. (5) A range of T urinals, now being largely adopted for all public work; the absence of any angle joints in these urinals (the joint being in the centre) rendering them most satisfactory. (6) A range of Adams's patent "Lit and Phil" urinals. In addition there are shown glazed ware division slabs (which have obvious advantages over either marble or slate), together with a fast-action surgeons' lavatory; a hospital closet set, slop sink and drainer; and "Titanite" lavatory. The closets comprise an "Epic" set, a range of S latrines, earth-closets, &c. These, with a fireclay wall fountain, a "Montrose" firegrate and a collection of "Adamesk" art ware and pottery make a small but representative selection of the productions of the firm.



T-URINAL BY ADAMSEZ, LTD.

Ripolin.

Special Position No. 6, Row B.

This stand has been specially designed to show the application of Ripolin to decoration in the Adam, Georgian and other styles. This enamel is now well known, and it meets with favour for its gloss, easy flow, durability, uniform quality and range and beauty of tint.

Granite Silicon Plaster.

Stand No. 38, Row B.

The exhibit of the Granite Silicon Plaster Co., Ltd., of 36, King's Road, St. Pancras, N.W., is arranged to show the advantages of this plaster for general interior work. It has been very extensively adopted for hospitals, infirmaries, &c., and for many buildings under the War Office and H.M. Office of Works. The firm also make a special feature of their 2in. solid partitions consisting of granite plaster with a central core of expanded metal lathing. Several very large contracts for these partitions have been executed, and there are also several in hand.

A Material to replace Ordinary Plaster.

Stand No. 38, Row C.

"Pytho" plaster is shown by the Plaster, Brick and Stone Co., Ltd., of Wall Grange, near Leek, Staffs. This is a material intended to supersede ordinary mortar plastering at the same cost, and to produce a surface as hard as the best Keene's cement. It can be painted or papered without delay. Only two coats are required, and these can both be applied in one day. The plaster can be polished whilst being applied and has the special merit of preventing the accumulation of dirt and disease germs.

Compoboard.

Special Position No. 5, Row F.

Compoboard needs no introduction, as it is known now to all architects and builders as a most convenient and cheap material for ceilings, walls and multitudinous other parts of buildings. The company which placed it on the British market has been in existence about five years, but the material was originally invented and made in America and afterwards very much improved by a Swedish manufacturing concern, and still further perfected by the present company, who established their new factory at Willesden Junction after the destruction by fire of the Swedish Company's works. Since the introduction of Compoboard into this country five years ago nearly 10,000,000 sq. ft. of it have been sold—ample proof of its good qualities. The firm's latest speciality is a fire-resisting Compoboard, made of non-flammable wood. Often the very great cost of fire-resisting materials renders their adoption extremely onerous, if not impossible. This material is designed to meet the need. Compoboard can be had in large sizes, and the joint edges being on the end grain of the wood there is no shrinking in the joints to be provided for, as in matchboarding and canvas. The address of the British Compoboard Co., Ltd., is Hythe Road, Scrubbs Road, Willesden.

Artistic Mantelpieces and Plasterwork.

Gallery Bay No. 21.

Messrs. G. & A. Brown, Ltd., of 167, Hammersmith Road, W., exhibit modelled and enriched plaster ceilings, cornices, friezes, mouldings, overdoors, centre-pieces, &c., for public and private buildings; mantelpieces, overmantles, wall panellings, mirror frames, electric-light fittings, &c., &c., in Louis XVI., Adam and Georgian styles; and examples of Italian and modern English plasterwork. The work is very tasteful in design and well executed, and comes as a welcome relief to the poor stuff produced by some trade firms with large connections. We illustrate on the next page a mantel and a piece of ceiling decoration as showing the good quality of the work done by Messrs. Brown.

FIBROUS PLASTER DECORATION BY G. & A. BROWN, LTD.

Adamant Plaster Slabs.

Stand No. 64, Row C.

The Adamant Co., Ltd., of Commercial Street, Birmingham (London offices and showrooms: 42, Berners Street, Oxford Street, W.), exhibit "Adamant" plaster, fire-resisting partitions and floors, fibrous slabs, decorative plasterwork, pugging slabs, blackboarding, &c. The front of the stand is moulded with the special moulding material (No. 2A) manufactured by the company, and the ceiling is in special fibrous "Adamant." The sides of the stand are constructed with "Manlada" partition slabs and are finished in "Adamant" No. 1 setting. These slabs, it is stated, have withstood the severest fire-and-water test of any slabs on the market of the same thickness. The company also show their

"Brit-Opal" Wall-glazing,

both plain and ornamental. A feature of this is the fixing of same in special waterproof cement for out-door work, or for positions exposed to extremes of temperature and atmosphere. A novelty is a small floor shown of glass tiles in squares, laid to pattern. These floors can be carried out to any design. At this stand also the Asphaltic Limestone Concrete Co. show their patented granited asphalt for roads and footways, various kinds of bitumen for electrical purposes, and their new patented asphaltic troughing and lid for electric cables.

"Opalite."

Special Position No. 1, Row A.

This material again furnishes an attractive and interesting exhibit, with the same ingenious structure seen at the last Building Trades' Exhibition. We understand that "Opalite" was the pioneer of opal tiling in England, having been brought before the public about ten years ago, since which time it has obtained the confidence of all architects who have specified it. It is an opalite tile or plate having a rough granulated backing (Shelmerdine's patent) fluxed into the material during manufacture, thus ensuring a secure key for fixing to any structure. It has been very largely used in hospitals, mortuaries, bathrooms, &c.—in fact, in all places where cleanliness and light are of first importance. Its close joint and highly-polished surface preclude the secretion of any fungi or vermin. The fact that about 250,000 sq. yds. have been fixed in London alone speaks eloquently for the material. Any design can be executed in "Opalite" and any effects of light and shade obtained. Wherever there is required a wall tiling which shall be attractive in appearance, impervious to dirt, unaffected by climatic influences and extraneous agencies, and which, moreover, shall be a brilliant reflector and diffuser of light, there "Opalite" will be found of value. Besides the exhibits of this material (the London concessionaire for which is Mr. William Griffiths, of 126, Hamilton House, Bishopsgate Street Without, E.C.), some artistically arranged dadoes in porcelain tiles are shown at the stand.

Opal Tiling.

Special Position No. 9, Row B.

Messrs. Durolite, Ltd., of St. Helens, Lancashire, and 86, Leadenhall Street, E.C., are showing their opal tiling "Durolite." The difficulty which besets all makers of opal tiling—the difficuly of the "grip"—has been overcome with a backing of a non-rigid nature specially adapted to allow for the variation in expansion or contraction of the cement and the tile. This backing practically forms part of the tile itself, and its value is further increased by the fact that it will "grip" immovably in any cement of good quality, no fancy patent cements being necessary. Quite a number of tile schemes are shown *in situ*, the erection being obviously designed for that purpose. In some of the schemes marbled tiles are shown with rich effect. In plain tints and pattern designs also there is a selection, the range of tints being extensive. Messrs. Durolite, Ltd., also show samples of their work in leaded lights and stained glass, and in the reproduction of landscapes.

Mosaic and Marble Work.

Gallery Bays, Nos. 25 to 30.

The Art Pavements and Decorations, Ltd., has a large display in six gallery bays; hence it is easy for visitors to obtain a full and comprehensive view of those things in which they are particularly interested. In the Mosaic section samples are shown of Roman cube mosaic, terrazzo mosaic, ceramic mosaic, Venetian glass mosaic and terrazzo steps; also samples of the mosaic now being laid in the new War Office, Whitehall, and the Royal College of Science, South Kensington. In the Marble section are shown large slabs of numerous beautiful and richly-marked marbles, taken from the actual stock held by the firm at their new works, St. Paul's Crescent, Camden Town. To enumerate a few, we may mention striking examples of Irish green, Pavonazetto, Verde Antico, Vert de Mer, Skyros and Mexican onyx. Staircases in Sicilian marbles and marbles for fireplaces, chimney-pieces, &c., are displayed in this section. The Tile section comprises every variety of tile that may be required for walls and floors, including many new designs for embossed dadoes.

Special Tiles.

The "Medmenham" tiles, produced at Marlow under the direction of Mr. Conrad Dressler, are a special feature. These tiles have long been favourably known to architects, and we learn that the firm has just completed an arrangement for the exclusive agency for all tiles produced under the direction of Mr. Dressler. Hand-made antique tiles, glazed briquettes for hearths and cheeks, and "air-pit" fires are prominent features in the tile

MANTEL BY G. & A. BROWN, LTD.

section, and we may also call attention to the firm's "Petroglas" paving tiles, claimed to be the hardest paving material known, being perfectly impervious to water and unaffected by oils, grease, acids, weather and frost. They should prove of great value in factories, electricity power houses, &c., especially in view of the fact that in addition to their other features they possess that of being perfect insulators capable of resisting an electric current of upwards of 10,000 volts. In the Joinery section are shown numerous varieties of

Parquet Flooring

in oak, teak, walnut, mahogany and jarrah woods; also wood-block flooring in pitch-pine, maple, oak, &c. The firm claim that their system of laying blocks is the simplest, yet most efficient, of any on the market; the tongues and grooves are formed on the blocks themselves, and there are no loose parts, iron pins, dowels, &c. Hardwood panelling is also in evidence in this section, as well as some good specimens of oak chimney-pieces, with inlaid marquetry ornamentation. The new works of the Art Pavements and Decorations, Ltd., at Camden Town, cover $1\frac{3}{4}$ acres and are provided with electrically-driven machinery for working marble, with a view to the expeditious execution of orders. The offices and show-rooms of the firm are at 7, Emerald Street, Theobald's Road, W.C.

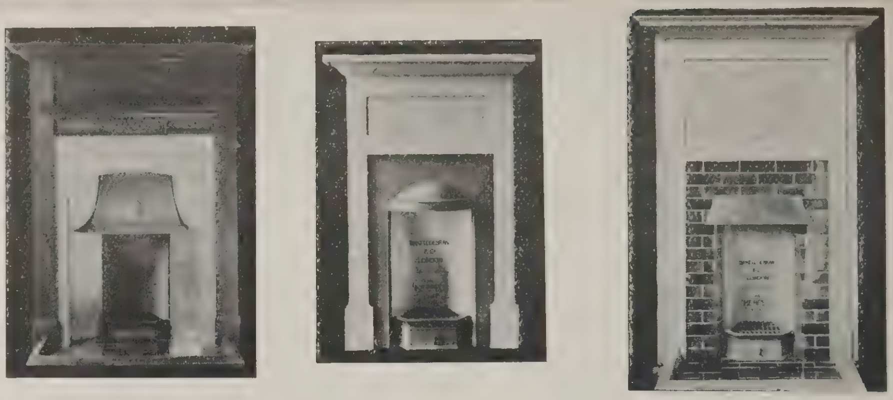
New Types of Firegrates.

Wall Space No. 134.

The exhibit of the Carron Co., of Carron, Stirlingshire, includes two new types of fire-grates which are well worthy of attention. We illustrate them below. Both are based on the same principle in design, which is to effect complete combustion with a saving of fuel. The bottom grate, concave in shape, forms with the movable front bar or trivet a well-shaped cavity, which by practical experience is found to be the most perfect form for combustion. After lighting, the fire is left with the front bar vertical for a few minutes till combustion has fairly begun, then, when the fuel begins to coalesce, the front gate is put horizontally. This allows the heat from the fire, radiating off the "Teale" firebrick, to diffuse throughout the room, without the intervention of a front bar to detract from either the appearance, brillance or heating power of the fire. These grates, therefore, are far more effective than the ordinary type.

"Esto" semi-slow combustion Grate.

Grate with "Radiant" Fire.



SOME DESIGNS FOR "HEAPED" FIRES BY BRATT, COLBRAN & CO.

The "Heaped" Fire.

Wall Space No. 128.

This patent grate is shown by Messrs. Bratt, Colbran & Co., of 10, Mortimer Street, W. The fire is not sunk below the hearth, but kept in full view, and there are no front bars to support the fuel, this being heaped against the back. The grate is said to burn very cleanly and the fire will last six or seven hours without attention. Some exceedingly good designs of mantels are obtainable with it. We illustrate three on this page, from which it will be seen that the grate has a very attractive appearance.

Builders' Ironwork.

Bay 7.

Messrs. Cakebread, Robey & Co., of 86, High Street, Stoke Newington, N., exhibit verandah castings, ranges, kitchen and portable stoves, mantelpieces, hearths and kerbs. Cast-iron baths and waste preventers, &c. are also shown, as well as painters' materials, brushes, colours and varnishes, plumbers' brasswork, locks and door furniture, leaded lights and stained glass. The "Ferrett" patent lock-fast joint for drain-cleansing and chimney-sweeping machinery is a speciality of the firm.

The Well Fire.

Wall Space No. 130.

The Well Fire Co., Ltd., of York Buildings, Adelphi, are showing their well-known type of hearth fire, the advantages of which are too well-known to need repetition. A large number of designs are exhibited which serve to illustrate the possibilities for artistic treatment which these fires afford. These designs deserve commendation when one recollects that the ordinary stock pattern fireplace is far too often of inartistic design. The Well Fire Co. also make a patent cooking-range, and hammered art-metal work is another branch of their work.

Hot-water Boilers.

Special Position No. 2, Row B.

Numerous types of wrought- and cast-iron boilers are shown at this stand by Messrs. Hartley & Sugden, Ltd., of the Atlas Boiler Works, Halifax, who are the sole makers of both these kinds of heating apparatus. The wrought-iron welded hot-water boilers shown include the conical "Stanley" boiler, the "Handy" boiler for fixing in greenhouse walls, the patent "Climax" boiler for fixing in brickwork, and the "Savile" boiler with cylinder connected for hot-water supply while the "White Rose" cast-iron sectiona boiler for hot-water supply is also show Several varieties of low-pressure steam boile are included in the exhibit, as well as cas iron radiators and cast-iron valves for ho water apparatus.

Electric Hoist for Builders.

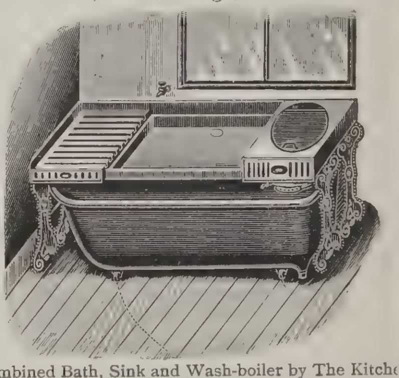
Wall Spa No. 127.

It is becoming increasingly appreciate among builders in this country that electr hoists offer great advantages for the raisin and lowering of materials on works, an there is little doubt that in the not far dista future these hoists will be the rule rather tha the exception on jobs of any importance. visit to this stand therefore should not omitted. The "Harman" electric hoist h been specially designed to meet the requir ments of the building trade and is made in tw sizes, one with a 3-h.p. semi-enclosed mot capable of lifting 8 cwts. at the rate of 80ft. p minute, and the other having a 10-h.p. mot capable of lifting 1 ton at the rate of 100 per minute. They are both very compact design and well and strongly made, t gearing being of worm type with ball-thru bearings. Messrs. Harman & Co. (who address is 10, West Moreland Buildings, E.C are also exhibiting a very neat electricall driven friction hoist in two sizes, one havi a capacity of 2 to $7\frac{1}{2}$ cwts. and the other 10 30 cwts.

Baths for Cottages.

Stand 60B, Row C.

The Kitchen Bath Fitment Co., of 51 Queens Road, Sheffield, are showing decided novelty in the way of combinati baths for cottages, and claim by their syste that practically no extra cost is put on t erection of property by the addition of the baths. One arrangement (as illustrated) is combined bath, sink and wash boiler. T water is heated in the wash-boiler and into the bath, which, when required, turned out from one end in a circular pa under the sink. Another type is a four-fo combination, viz., range, bath, sink a wash boiler, in which arrangement the wa is heated by the ordinary kitchen fire, a the sink lifts up like a lid, exposing the ba underneath. The patentee of these device Mr. Herbert H. Hodkin, of Messrs. Hodkin Jones, Ltd., Sheffield.



Combined Bath, Sink and Wash-boiler by The Kitche Bath Fitment Co.

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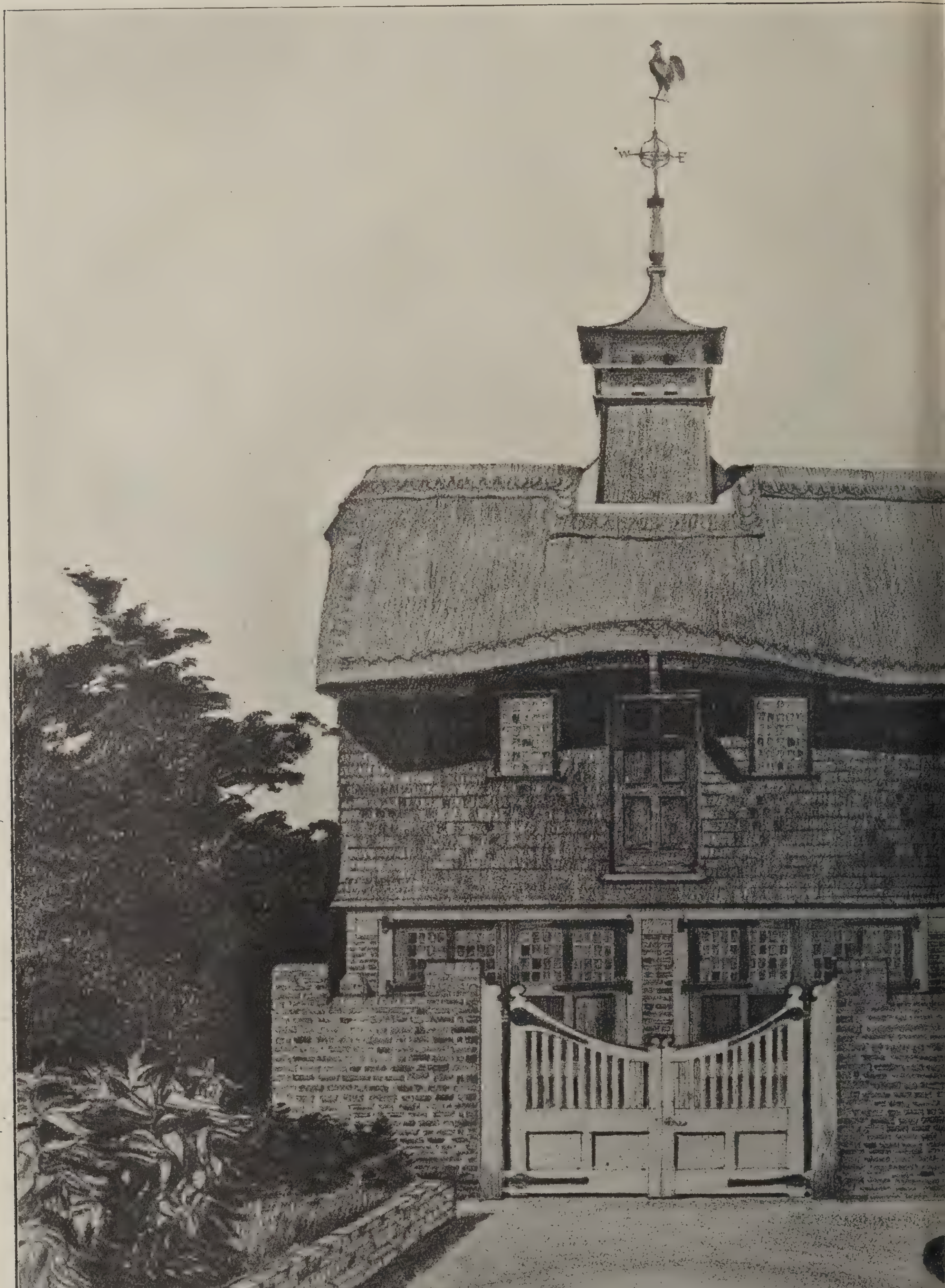
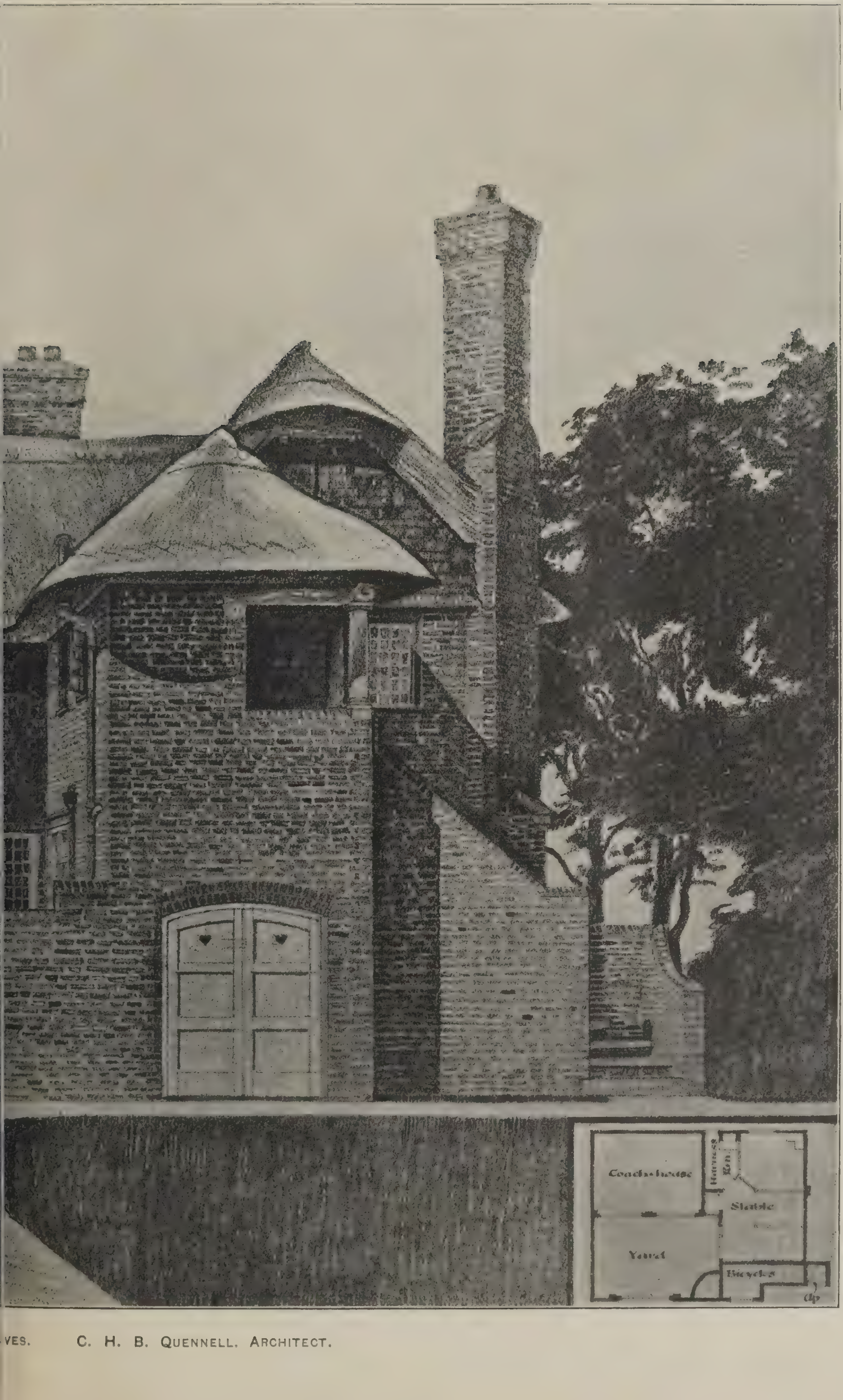
Supplement to
The Builders' Journal and Architectural Record,
Wednesday, April 26th, 1905.



STABLES, "GALLOPS HOMESTEAD," PLUMPTON



VES. C. H. B. QUENNELL. ARCHITECT.

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JOINERY.

There are several interesting exhibits of novelties in the way of joinery. We may particularly mention the Gilmour veneered door and a window balance of Australian invention. Several varieties of reversible windows serve to emphasize the importance of this convenience and the safeguard to life and limb which it affords. There are many attempts made to improve on the ordinary methods in joinery that have existed for decades, and novelties of all kinds are constantly appearing, but very few of them last for long or come into general use, the fault being that they are intricate and soon get out of order and cost more than the ordinary methods.

A Window without Sash Cords and Weights.

Stand No. 6 in Minor Hall.

The acknowledged deficiencies of the ordinary sash window have led to many attempts to improve on it, and of recent years we have seen numerous reversible windows, wire sash cords, &c., placed on the market, but for the most part they fail to come into general favour. A new window which has just been introduced in this country by Messrs. Recorders, Ltd., 171, Queen Victoria Street, E.C., gives every promise of not falling into the same category, for the invention is so simple and so obviously a vast improvement in all directions upon the ordinary sash window with cords, pulleys and weights, while, perhaps most important of all, it adds nothing to the cost. The invention is an Australian one, having been made by an architect in the Bush, and is the outcome of necessity, as it was designed to meet a difficulty found by him in erecting a timber-framed house where there was not sufficient room in the openings for boxings for weights. It will be seen from our illustrations that the essence of the invention is a lever (marked A in Figs. 1-4) pivoted in the centre and fixed on the frame of the window, and attached at one end to the top sash and at the other to the bottom sash. These two sashes, it will be at once understood, counterbalance each other without any complication being necessary, such as weights entail. From the sections (Figs. 1-4) and photographs (Figs. 5-6) it will be seen that by pulling the bottom sash forward, the window is opened. In Fig. 2 it is pulled slightly forward, not sufficient to raise the bottom sash (which might cause a draught), but just enough to leave an opening at the top. The fresh air enters through the larger opening in the middle, and the opening at the top permits the foul air to escape. This gives efficient ventilation, and it is perfectly safe to leave windows open in this position at night without fear of burglars, because a bolt in the bottom rail will lock the window safely. This bolt (marked D on the sections) when pushed partially on one side serves as a pin running in the bottom groove in the frame, and when moved still further on one side releases the bottom sash altogether, allowing it to be pulled forward into the room for cleaning purposes, as shown in Fig. 5. The top sash also has a pin running in a groove in the frame, but by turning the thumb screw marked A a portion of the parting bead may be removed so as to allow this pin to slide out of the groove C, and the sash to reverse inside for cleaning, as shown in Fig. 6. This ability to reverse the sashes disposes of the difficulty of cleaning the window, and of all the objections which could be raised from the fact that the bottom sash will not slide right up to the top as in the ordinary type. In Fig. 3 it is shown open to its greatest extent, giving full ventilation at top, bottom and middle. Fig. 4 shows the bottom sash raised to its greatest height. Existing sash windows can be altered at a small cost. The cost of these fittings is not much, and a saving is effected over the whole window by reason of all weights, pulleys, cords and box-frames being saved. The inclined louvre position of the window is a noticeable point with regard to ventilation.

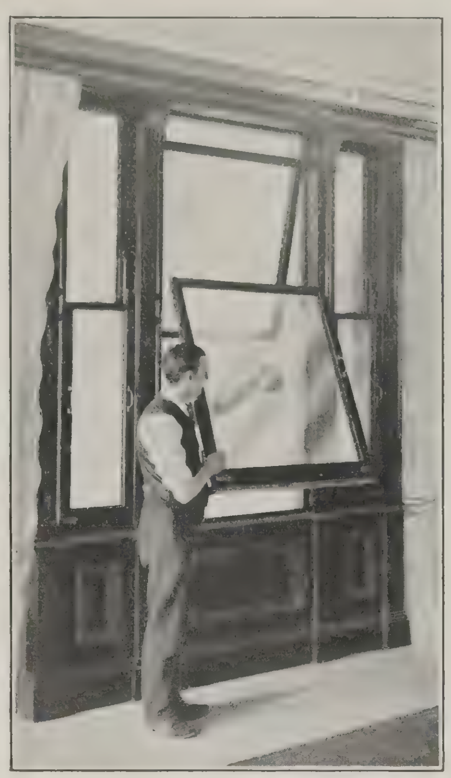


Fig. 5.—Bottom Sash in position for cleaning.

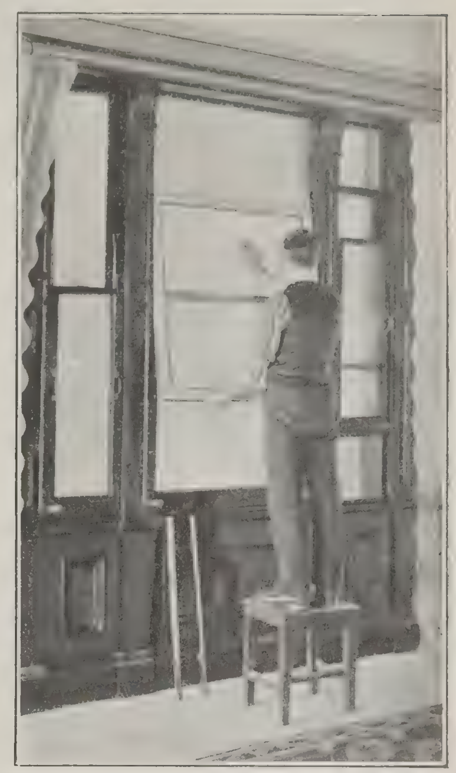


Fig. 6.—Top Sash in position for cleaning.

Sliding and Reversible Windows.

Stand No. 12, Gallery.

Messrs. W. G. & L. England, of Summer Lane, Barnsley, are exhibiting their patent sliding and reversible sash windows, the advantages of which are obvious. The simplicity of the fittings is noteworthy in Messrs. England's sashes, it being possible to instantly detach the sash from the frame by the removal of two screws. All the fittings are in view—another advantage; while another point of interest is that when a window requires new cords the sash may be removed and new cords attached without disturbing any of the beads or disfiguring the paint. Any existing windows can be adapted to this invention.

Reversible Window Sashes.

Stand No. 48, Row B.

The "Unique" reversible window sash is shown at this stand by Messrs. Martin's Patents Co., Ltd., of 11 and 12, Finsbury Square, E.C. The cost of the fitting for one pair of sashes, consisting of No. 4 patent centres and about 12ft. run of hardwood bead, which any joiner can fix to old or new windows, is 5s. 6d. in malleable iron and 7s. 6d. in gunmetal. Existing sashes are altered for 15s. per opening of two sashes, including making good paint, &c. For asylums the system is adapted so that the sashes cannot be raised or lowered more than a few inches without a key. A patent door spring is also exhibited at this stand.

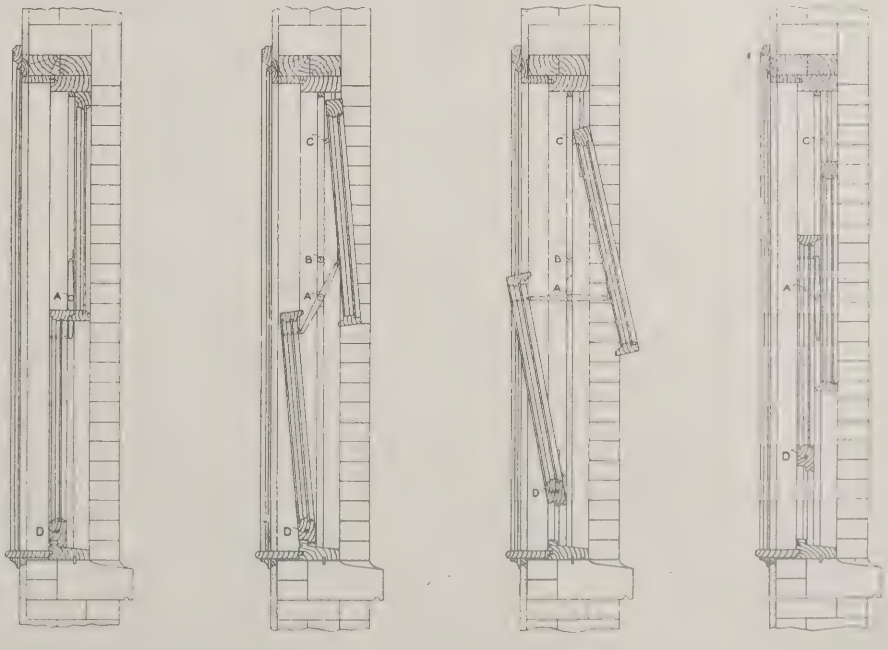


FIG. 1. FIG. 2. FIG. 3. FIG. 4.

A WINDOW WITHOUT SASH CORDS AND WEIGHTS, BY RECORDERS, LTD.

Design for Double Gilmour Doors.

Hardwood Doors.

Stand No. 62, Row C.

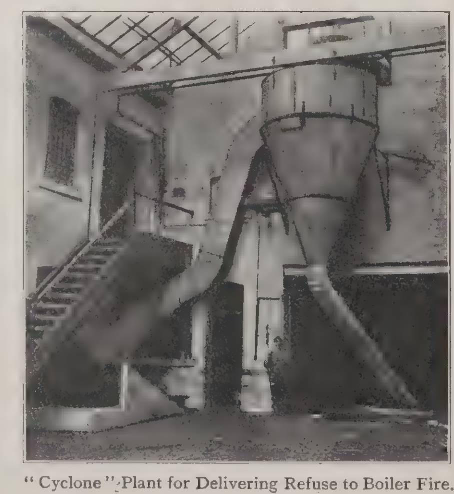
The Gilmour hardwood doors have attracted considerable notice during the past year as an innovation in joinery as regards this country. They have not previously been shown at the Exhibition, and architects and others will undoubtedly find the exhibit at this stand one of the most noteworthy in the hall. The construction of these doors is a perfectly logical use of the material. The interior core is formed of strips of selected pine, each strip having its grain reversed to that adjoining. This core is dried with 200 degs. of heat, and has the function of preventing warping, twisting, splitting or shrinking. The exterior finish is obtained by the use of a veneer, which is welded to the core under great pressure and secured from the danger of blistering or peeling by grooves and tongues and special water-proof cement. The panels are constructed of 5-ply strips of wood. The cost of these doors is considerably less than ordinary hardwood doors, while they are at the same time much more durable, and have a beauty which can never be obtained in the solid wood. The construction of these doors permits of the possibility of framing in other ways than the traditional manner, as will be seen by a glance at the number of designs exhibited, which we think will be admitted to be artistic. One special application which the construction of these doors has permitted is a door for hospitals and infirmary work with an absolutely smooth surface which is highly advantageous from the hygienic point of view, providing as it does no lodgment for dust or any other foreign matter. It has the appearance of a solid plank, and can be made with or without a glass panel for observation purposes. Although this firm makes a number of stock patterns, special doors can be constructed to architects' designs, but the stock patterns allow of considerable variation by the application of mouldings of any section. The doors are a Canadian invention and are the outcome of conditions, the climate there having proved the inefficiency of the old-time methods of construction. They have been used in that country and the United States for many years to the practical exclusion of the solid hardwood doors, and have therefore been thoroughly proved under the severest practical conditions.

Design for Gilmour Door for Hospitals.

The Removal of Sawdust and Chippings in Sawmills and Joinery Works.

Bay 21.

Messrs. Matthews & Yates, Ltd., of the Cyclone Works, Swinton, Lancs., exhibit a working model of their "Cyclone" refuse-collecting apparatus, suitable for use in sawmills and joinery works. Chippings are fed into the exhauster that creates the suction to take them as they leave the machine cutters, and are then passed through the separator, from which they fall again to the suction of the exhauster, so maintaining a circulation of the chippings. All that would be needed to complete the plant (which, although a model, is equal to dealing with three or four machines) would be to connect the suction side of the exhauster to the machines, instead of to the delivery end of the separator, the proper place for the latter of course being the boiler-house or refuse heap. There are many advantages claimed for this apparatus, the foremost being its merit as a labour-saving device. The old-fashioned method of allowing the refuse to fall into pits, to be shovelled out again into bags, is very costly, not only on account of the handling of the refuse but the loss of time during which the machines are stopped. A moulding machine often buries itself with refuse in two or three hours, and the trouble and labour entailed in keeping it clear is necessarily very considerable. Therefore this saving alone is worth consideration by all users of cutting machinery where refuse is thrown off. But, in addition, there is the reduced risk of loss by fire, because it necessarily follows that where a mill is kept clean and the sawdust and chippings are removed as fast as they are made the risk from fire is much less than in a mill where the refuse is allowed to accumulate in heaps in all directions. As a consequence, fire-insurance companies will quote a smaller premium where a "Cyclone" apparatus is installed.



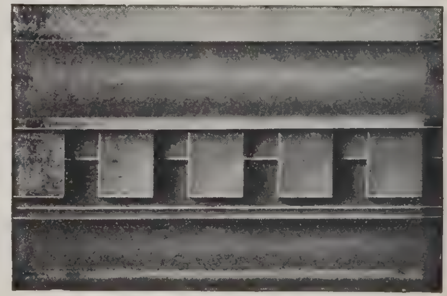
"Cyclone" Plant for Delivering Refuse to Boiler Fire.

Messrs. Matthews & Yates show several sizes of exhausters. Particular attention is paid to the blades, which are accurately balanced and powerfully made. The firm has installed many plants all over the country, one of the most recent being that for the Brush Electrical Engineering Co., Ltd., at Loughborough. At these works the machine shop, which is fitted to prepare the timber framing for the large number of cars turned out annually, is 200ft. long by 120ft. wide, and contains about sixty woodworking machines. A No. 8 exhauster has been installed, working in conjunction with a No. 9 "Cyclone." The delivery pipe between the machine-shop and the boiler-house (where the refuse is burned) is about 320ft. long, and extends over the works like a great snake. At the sawmills of Messrs. Baird & Co. at West Hartlepool the sawdust is drawn into a large bin and thence delivered down a chute into trucks. A typical "Cyclone" plant delivering to the front of a boiler is that erected at the cabinet works of the Wholesale Co-operative Society, Manchester, shown by the accompanying photograph. In addition to such fans as those described above, Messrs. Matthews & Yates exhibit "Cyclone" electric fans for ventilating purposes. These are used for ventilating the committee-rooms of the House of Commons, and are therefore of special interest just now.

Woods; Machine-carved Mouldings.

Wall Space 124.

Stocks of American hardwoods, American whitewood, pine, mahogany, round and square turned newels and balusters, turnery of every description, handrail, and oak and maple flooring, &c., are shown by Messrs. Cobbetts, of Virginia Road, Bethnal Green; but the special exhibits at this stand are the "Marbut" machine-carved mouldings, here illustrated. These have a large market for cheap and sound work.



French Mouldings.

Stand No. 26, Gallery.

Gilt mouldings of French industry for frames and tapestries are exhibited by Mons. X. Ramspacher, of St. Dié (Vosges) France, for which mouldings the general agent in England is Mr. E. Thiroux, of 3, Tudor Street, Ludgate Circus, E.C. The firm export annually about 20,000 kilometres of mouldings of all sorts. A large panel of inlaid flooring by Messrs. Ausseur et Hipp, of Paris (for whom also M. Thiroux is the general agent in this country), is also exhibited, as well as litho marquetry of all kinds.

American Whitewood.

Wall Space 141.

A speciality of American whitewood is made by Messrs. C. & R. Light, Ltd., of Curtain Road, E.C. This useful wood is obtainable in all thicknesses from ¼in. to 10ins. and of any width up to 36ins.; it can be had in 8ft. to 16ft. lengths, and also in fascia boards 1in. thick, 18ins. and more wide, and from 11ft. to 20ft. long. Messrs. Light are also bringing into more prominence "3-ply" in various woods, such as walnut, oak and birch, in sizes up to 72ins. by 24ins. This is a very useful article for panels, &c. Being highly finished and ready for use, it effects a great saving in labour, and it is of greater strength than twice its thickness in 1-ply.

Gilt and Enamel Letters.

Wall Space 137.

The Brilliant Sign Co., Ltd., of 38, Gray's Inn Road, W.C., show brilliant concave metal letter richly gilded, in many styles, shapes and sizes, for affixing to the inside of windows; also for fascias, stallplates, &c. Large gilt wood letters, enamel letters, prismatic gold glass letters, day-and-night signs, and many other novelties made by the firm, are also exhibited. This year the firm has decided to sell their brilliant letter, unfixed, to the trade proper at very big discounts from standard rates, with guaranteed fixing instructions. This enables the trade to make a good profit out of the specialities, and to keep the whole of the work in their own hands.

FIREPROOF RESISTING CONSTRUCTION.

Nowadays the importance of fire-resisting construction in building practice makes this section of the exhibition one of the chief features. A number of established firms are exhibiting their various systems. Partitions are much in evidence, while the stands of those firms specializing in flooring are always striking, and fully show the various applications of their systems. We may mention that this year the well-known fire-resisting material "Uralite" has been used for constructing a number of the stands in the hall.

Damp-courses, Felts, Fireproofing, &c.

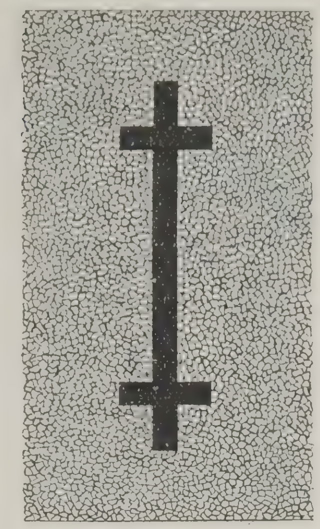
Stand No. 55, Row C.

Messrs. McNeill & Co., of Bunhill Row, E.C., and Kirkintilloch, near Glasgow, exhibit a number of specialities which are of general application in building operations. They show several sheet damp-courses, namely, patent metal asphalt, bitumen, pliable mastic and fibrous asphalt damp-courses, all of which do not crack and are made to suit different widths of walls. In the matter of sound-deadening materials, Messrs. McNeill show dry hair felt, bituminous hair felt and slag wool or silicate cotton. Both the last two are vermin-proof and the slag wool is generally esteemed an invaluable commodity. This firm also make slag-wool slabs for fireproofing. Their inodorous felts and bituminous hair felts for the lining of roofs are efficient non-conductors and are damp- and vermin-proof. Fibrous plaster slabs are also exhibited, and are admitted by most who have used them to be an improvement on the old-fashioned method of plastering.

Columbian Fireproofing.

Stand No. 54, Row C.

The Columbian Fireproofing Co., of 37, King William Street, E.C., have done so much admirable work in England that their system is becoming one of the stock things in building construction. Their stand is a striking one, and here the various applications of their system are well shown. The essential features of this system are the cruciform-ribbed bars, which by their special shape are economical of reinforcing metal and utilize to the full the strength of the concrete. Three forms of Columbian fire-resisting floors are used—1, panel; 2, double construction; 3, ribbed-bar floor between main girders. The ribbed bars are suspended in stirrups. We illustrate the bar above. It will be recollected that this firm underwent a very severe official fire test, and came out with flying colours. One special application of the system is remarkable, namely, its adaptability for roofs, the fire-resistance of which is not enough studied in view of the great danger from the spread of fire by that means.



COLUMBIAN BAR.

"Mack" Partitions.

Stand No. 57, Row C.

It will be recollected that the "Mack" partition slabs and hollow blocks successfully underwent a severe official fire test. They have since been increasingly used, and very many important buildings now contain them. The "Mack" patent slabs are made from specially-prepared gypsum, &c., and have embedded in them strong hollow reeds of the nature of bamboo. These reeds form air-chambers, and with the plaster make a light non-conducting material of great strength. The air cells formed by the reeds have as one of their objects the breaking up of sound vibrations so as to prevent sound passing through the partitions. No iron rods or metal keys are required in their erection and partitions constructed with these slabs possess considerable rigidity. Woodwork can be fixed direct to the partitions without plugging. The slabs are made in four thicknesses—2ins., 2½ins., 2¾ins. and 4ins.—the blocks being each 6ft. long and 12ins. high, the top and bottom edges having grooved and tongued joints, the vertical ends being concave. The method of fixing these slabs is to build them up with a break-joint bedded in plaster, and to grout up with plaster the vertical hollow joints formed by the concave ends, and also the joints between slabs and door frames and slabs and brick walls. Where the slabs are cut in half, concaves may be easily made in the ends by sawing out a **V**-piece. External angles are bonded over each alternate course as in brickwork. Door frames should be fixed in position before commencing to fix slabs, ½in. square fillets being fixed to the frame to receive the concave ends of the slabs. The address of Messrs. J. A. King & Co., the manufacturers, is Bridge House, 181, Queen Victoria Street, E.C.

Plate-wall Partitions.

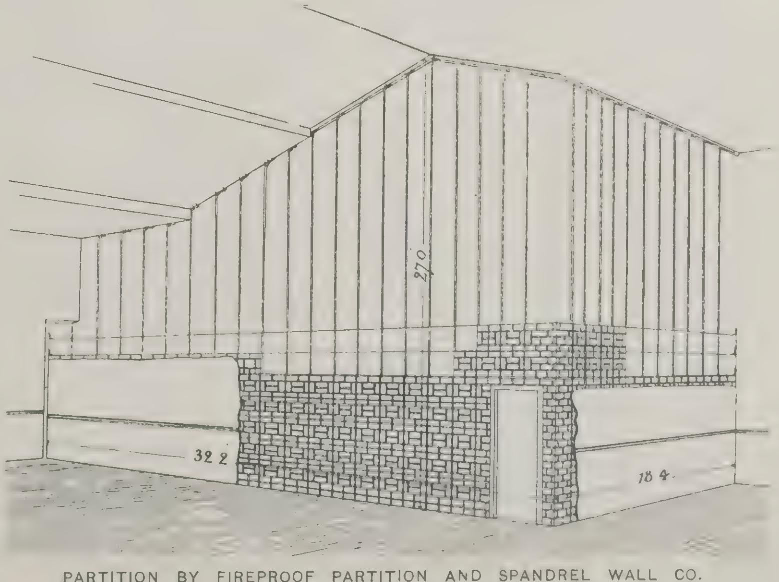
Stand No. 63, Row C.

The London Fireproof Plate-wall Co., Ltd., of 60, Watling Street, E.C., are exhibiting Bruckner's patent partitions, in regard to which it should be noted that use is made of internal rods to increase the strength and rigidity. By these means walls of any size can be safely erected, and the system also allows the whole structure to be suspended from overhead beams in positions where the floors are not capable of carrying a weight. The plates are made in three thicknesses, namely, 2ins., 2½ins. and 4ins. The firm also has systems of protecting constructional ironwork, as well as a cheap partition which goes under the name of "Lancastrian Plates," and patent ceiling plates for protecting wood joists from fire.

Strong 4½in. Brick Walls.

Stand No. 107, Row F.

The Fireproof Partition and Spandrel Wall Co. are exhibiting a simple partition showing their system of construction, but space does not permit of demonstrating its advantages on a large scale. The special feature about this system of constructing walls and partitions is that they can be erected without supporting beams or girders or foundations to carry them throughout their length, the weight being transmitted to stanchions, wooden uprights or other vertical supports by hoop-iron bonded between the bricks both vertically and horizontally. The hoop-iron is embedded in cement and so protected from decay and fire. By this system 4½in. walls can be safely built to any height and almost any width of span, so being very economical, while it is claimed that a 4½in. wall can be constructed for small houses, garden walls, &c., cheaper than a 9in. one and, built in cement, is more efficient in all respects.

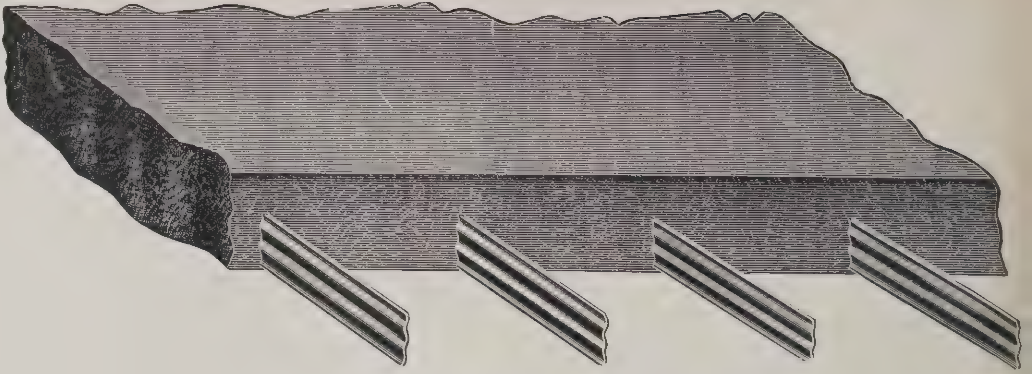


PARTITION BY FIREPROOF PARTITION AND SPANDREL WALL CO.

A Corrugated-bar Floor.

Stand No. 60, Row C.

Messrs. Hodkin & Jones, Ltd., of Sheffield and London, exhibit their corrugated-bar system of fire-resisting floors, which they claim to be cheaper and stronger than other existing forms. Two pieces of flooring are shown, one being 8ins. thick, having 6in. corrugated bars embedded, and the other being 6ins. thick, with corrugated bars 4ins. deep. The object of this form of bar is to eliminate all flanges, which are the chief cause of longitudinal cracks, common to fireproof floors.



HODKIN & JONES'S CORRUGATED-BAR FIRE-RESISTING FLOCR.

Expanded Metal.

Stand No. 82, Row D.

The new Expanded Metal Co., Ltd., have erected a light steel frame building measuring about 16ft. by 16ft., on which is built a suspended expanded steel and concrete floor 3ft. off the ground, and show a suspended ceiling 9ft. above the floor with roofing above that. For the floor they are showing two spans of 8ft. by 16ft. long, one span being completed flooring, and the other flooring in progress, showing the method of construction. For the ceiling different applications of their lathing are shown; and with regard to the roof, on one side is erected some roofing *in situ* and on the other side some expanded metal and concrete slabs on rolled-steel-joist purlins about 4ft. apart. In addition, there are some partitions and walling upon the framework, both hollow and solid, to show their different systems, and some of the steelwork is encased for the same purpose. Some expanded steel and concrete steps are erected up to the floor, and a wood-framed door and sash are put into the walling and as many systems and details as possible worked in, so as to make the exhibit instructive to the trade. In the forecourt of the space are shown various goods made up with iron bar and expanded metal, such as fencing, tree-guards, lockers, baskets, builders' screens, riddles, &c. We publish below an illustration showing the machine for cutting expanded metal up to 16ft. long in the direction of the longway of the mesh.

Fire-resisting Partitions.

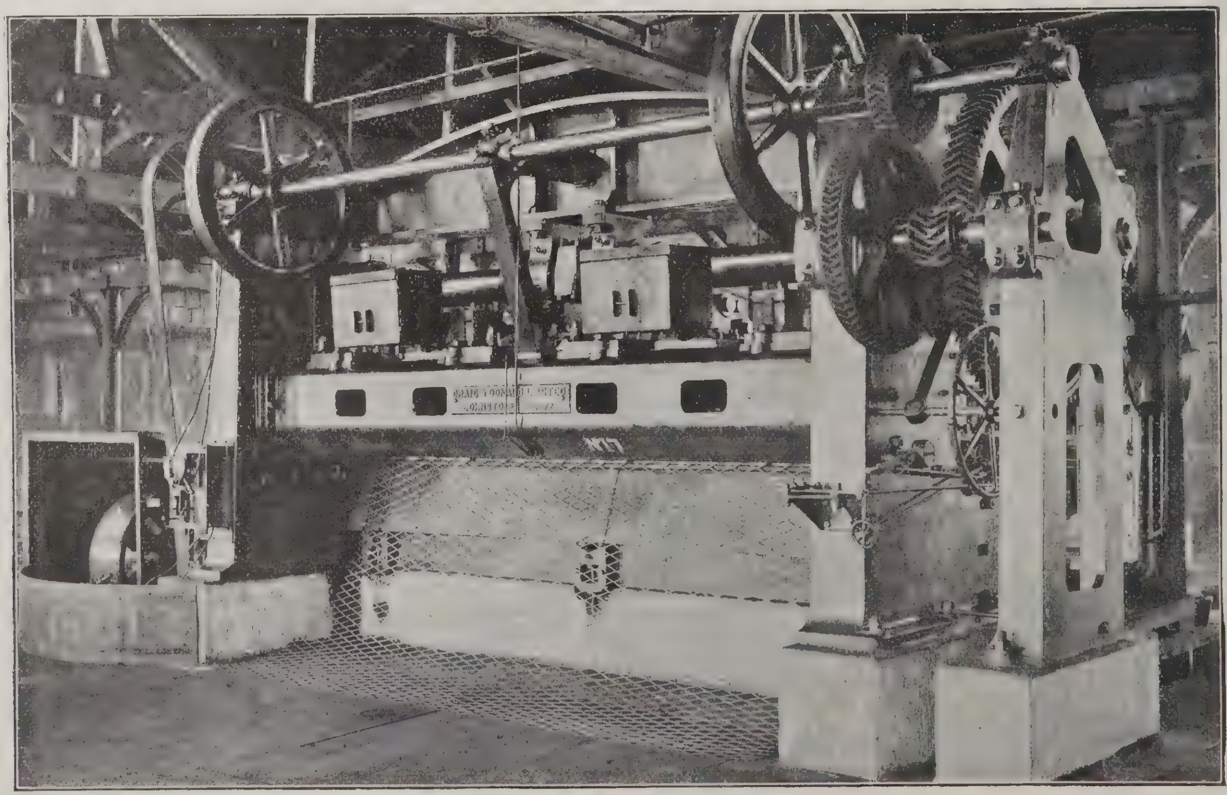
Special Position No. 8, Row E.

The exhibit of Messrs. Frederick Jones & Co., of Kentish Town, London, N.W., Manchester and Middlesbrough, is built of their fire-resisting partition specialities. They show three partitions, *i.e.*, the "Hercules," the "composite," and one built with concrete building blocks. In the interior of their stand are neatly-arranged patterns of their fibrous and fireproof plaster slabs—popular means of rapid and fire-resisting plastering. A variety of samples of their "Pioneer" brand of slag-wool ("silicate cotton") in all its different forms is also shown, suitable for fireproofing, soundproofing and heatproofing purposes. The price of this material appears to have been reduced lately, and it now stands safely outside the category of luxuries. We would advise all those interested in fire-resisting and non-conducting materials to pay a special visit to this stand.

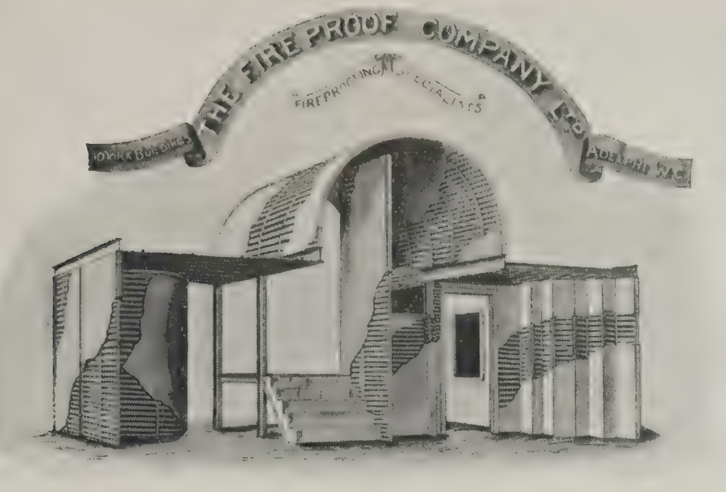
Dovetail Corrugated Sheeting for Partitions, &c.

Bay No. 2.

The Fireproof Co., Ltd., 10, York Buildings, W.C., are showing a well appointed exhibit of the various kinds of work to which their speciality of dovetail corrugated sheeting, &c., may be applied. This dovetail corrugated sheeting is used in conjunction with **H**, **T** and channel irons and plastic material to form fire-resisting partitions, floors, ceilings, &c. The advantages secured are very great strength, a perfect double key for whatever kind of plastic material may be used as a covering, and a great saving in space (inasmuch as a partition may be finished at not more than 2ins. thick); the result being a very strong and fire-resisting partition, for if, under the combined effects of heat and water, the thin setting coat of plaster should become dislodged, the dovetails would effectively retain their portion of the plaster, which, owing to the dovetail form, it is impossible to remove under ordinary circumstances. Among the work which this exhibit is intended to illustrate may be mentioned L.C.C. staircase enclosures and lift enclosures (both of which can be finished 3ins. thick) and suspended ceilings of shallow-section dovetail corrugated sheeting. This latter is used as a permanent centering to concrete floors, thereby avoiding all use of wood centering, an important feature, as all work in the building can be carried on without interruption while the concreting is being proceeded with. The exhibit also shows the utility of the sheeting for forming straight partitions, ordinary divisions to rooms finishing 2ins. thick and being fire, sound, damp and vermin proof. For irregular work with sharp returns, panelling and so forth the sheeting is admirably adapted, and for curved work, girder and stanchion casings, &c., it is especially suitable. The illustration on the next page shows the exhibit which has been designed to give a practical illustration of fire-proofing requirements in the construction of modern buildings. The dovetail corrugated sheeting



MACHINE FOR CUTTING EXPANDED METAL.

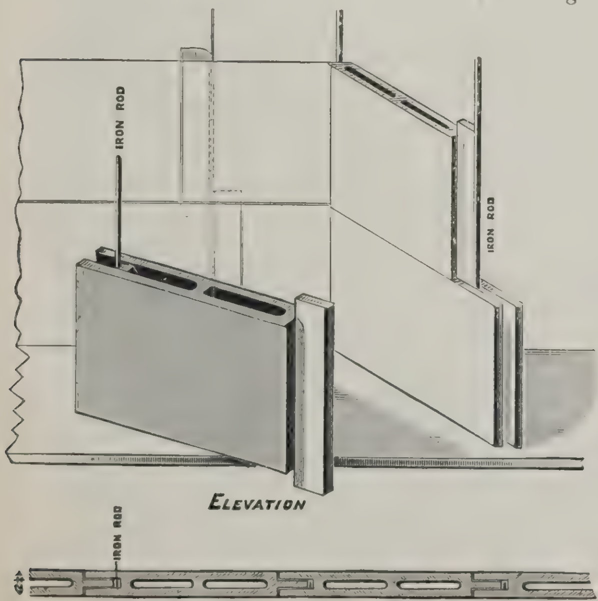


is suitably employed to reinforce concrete under all conditions, whether as floors or ceilings. Complete buildings with or without steel framework have from time to time been erected upon this system, the interior and exterior walls being plastered to a total thickness, in most cases, not exceeding 2ins. and 3ins., sand and cement being used as the outside covering to the sheeting and being finished as desired—rough-cast, pebble-dashed, hand-floated or lined to represent masonry. Roofs to these complete buildings are also constructed with shallow-section dovetail corrugated sheeting carried by **H**-section bars used as purlins, and the same plastered outside and inside to a total thickness of 2ins., or the roof plastered and tiled, or slated. Such buildings have the special merit of comparative light weight, with the consequent saving in cost of foundations.

Havelock Patent Plaster Partition.

Stand No. 60A, Row C.

The Havelock Patent Plaster Partition Co., of 63, Finsbury Pavement, E.C., have a unique demonstration of the rigidity and lightness of their patent partitions. A large piece of partition about 14ft. by 8ft. is shown carrying itself by lateral support on the two sides, being unsupported both at top and bottom. This result is achieved by reason of the blocks being so constructed as to tenon into one another. "Havelock" partitions have been used at St. James's Palace and other important buildings.



THE "HAVELOCK" PATENT PLASTER PARTITION.

Bucket Fire-extinguishers.

Stand 109, Row F.

The patent bucket fire-extinguisher made by Messrs. Messer & Thorpe of 8, Quality Court, Chancery Lane, W.C., is the acme of simplicity, and furnishes a most valuable means of keeping ready in a small space a large number of buckets filled with water. The buckets fit into one another in a neat tank, and being kept in place by guides, can be withdrawn without any risk of jamming. In every case after each nest of buckets has been withdrawn there is sufficient water remaining to refill five of the buckets—thus, with a 10-bucket tank, providing 15 buckets of water in constant readiness.

Trucks.

Bay 3.

Slingsby's patent trucks, and trucks of all kinds, are shown at this stand. A selection of about 60 from 1,000 varieties is kept permanently on view at Mr. Slingsby's offices, Old Street House, E.C. The business comprises twelve lines, including, in addition to Slingsby's patent trucks, sack trucks (Slingsby's patent collron), hand carts, tipping wagons and portable railway, wheelbarrows, &c. All kinds of wheels and tyres are supplied also.

Boilers, Stokers and Water Softeners.

No. 6, Arcade.

Messrs. Babcock & Wilcox, Ltd., of Oriel House, 30, Farringdon Street, E.C., exhibit models of their patent water-tube boiler for land purposes, their chain grate stoker for burning low-grade fuels smokelessly, and their water softener and heater, as well as specimens of their tube cleaner and their wrought-steel steam piping. The combined water softener and heater is Oscar Guttmann's patent and has been designed for the purpose of removing (by chemical means) the scale-forming matter from water, thus preventing incrustation in boilers. The apparatus works automatically, a float regulating the admission of the hard water and the soda solution in proportion to the quantity of soft water drawn off. Either exhaust or live steam can be employed, and thus the apparatus is a water softener and feed-water heater combined.

Shannon Files.

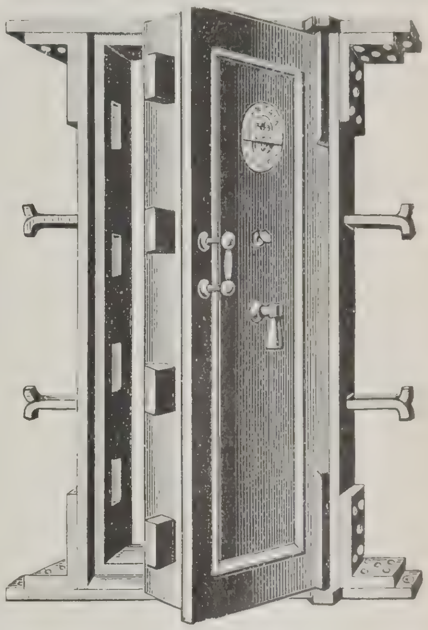
Bay 8.

The exhibit of the Shannon, Ltd., of Ropemaker Street, E.C., comprises the Shannon system of filing and classifying records and correspondence and business papers of all kinds for rapid reference and security; office labour-saving specialities and furniture.

Party-wall and Strong-room Doors.

Wall Space 123.

The specialities shown by Mr. John Tann, lock and safe engineer, of 11, Newgate Street, E.C., are party-wall doors (at greatly reduced prices) in conformity with the insurance companies' requirements; and a new pattern strong-room door at prices greatly below those charged hitherto. This latter door is shown by the illustration below.



Strong-Room Door by John Tann.

The remainder of the exhibit comprises "Anchor Reliance" safes for all purposes, built with fire- and burglar-proof steel, bent without joints at the corners and having immovable flanged backs.

Filing Cabinets.

Stand No. 105, Row F.

Filing cabinets and modern office specialities are shown by the Lyle Co., Ltd., of Gray's Inn Road, W.C.

Account Books and Files.

Gallery Bay, No. 22.

Perpetual systems for account-keeping are shown by the Trading and Manufacturing Co., Ltd. (offices: Temple Bar House, Fleet Street, E.C.), consisting of the "Dade" ledgers, order blanks, invoice duplicate systems, loose leaf binders and devices. There are also shown the "T. and M." card-index costing systems, vertical files for correspondence, &c., and the "T. and M." individual file and renewable leaf or section catalogue cover.

Gas and Oil Engines.

Wall Space 121.

Crossley's gas and oil engines (of which more than 52,000 had been sold up to January 1st last) are exhibited at this stand. The engines shown are four in number, namely, an "OE" type engine and dynamo combined, capable of developing 14·5-b.h.p. as a regular working load with town's gas and 11·2-b.h.p. as a regular working load with suction gas; an "H" type gas-engine capable of giving 1-b.h.p. as a regular working load; an "N" type gas-engine capable of developing 10-b.h.p. as a regular load; and an "LLE" type high-speed electric-lighting oil-engine combined with dynamo, this engine being capable of developing $3\frac{3}{4}$-b.h.p. as a regular load. A No. 2 suction gas plant is also exhibited.

FORMING PARTITION WITH "PHŒNIX" SLABS.

Fire-resisting Slabs.

Stand No. 16, Row A.

The Excelsior and Phœnix Fire-resisting Partition and Ceiling Co., Ltd., of 163, Palmerston House, E.C., exhibit their fire-resisting slabs for partitions and ceilings. These are made in the usual sizes, 3ft. by 12ins., and in thicknesses ranging from ⅝in., ¾in. and 1in. for ceiling slabs to 1½ins., 2ins., 2½ins., 2¾ins., 3½ins. and 4ins. for partitions. They are not plaster slabs and they are not hollow, nor do they contain reeds. The company make the so-called "Phœnix" slabs for ceilings and partitions, which are chiefly composed of crushed pumice stone and lime, and the "Portland Phœnix" slabs, which are made of Portland cement and crushed pumice stone. The company's slabs have been tested by the British Fire Prevention Committee up to 2,000 degs. Fahr. The slabs can be plastered dry, and are sound-proof as well as vermin-proof. They are easy to erect, can be sawed and nailed, and become exceedingly hard with age, so that it is claimed they can be used for outside work.

Fire-resisting Wood.

Stand No. 69, Row C.

The importance of fire-resisting wood in present-day building construction needs no emphasis. The Fire-resisting Corporation, who supply non-flammable wood and impregnated scenery, ropes, &c., for theatres, &c., have an interesting stand where they exhibit mantels, window frames, doors, cabinet files and joinery of every description made in fire-resisting wood. The firm now undertake the working of wood in their shops at Fulham, and supply joinery of every description. The chemicals used by the company are phosphate of ammonia, sulphate of ammonia, and boracic acid in definite proportions. The treatment is throughout the fibres of the wood, and not merely superficial, as can be easily tested by applying a splinter about the size of a lead pencil from the prepared wood and holding it in the flame of a gas burner. If it lights and spreads the flame to the end of the splinter, either the strength of the solution was too weak or the wood has not been thoroughly impregnated. Some woods, of course, take the treatment better than others. The impregnation is performed in a large steel cylinder, under pressure, which forces the solution through all the pores of the wood, crystals of the chemicals being left throughout the substance of the wood when it is dried out. The address of the Fire-resisting Corporation, Ltd., is, Townmead Road, Fulham, S.W.

Concrete Partitions.

Stand No. 40, Row B.

The fire-resistance of concrete has been so often proved up to the hilt that every architect now relies upon it, one would almost say, as his final line of defence. The Acton fire-resisting partitions are of concrete and are constructed in slabs of a form which gives lateral and vertical stability. The slabs are solid and usually 2ins. thick; they afford a good key for plastering, tiling, marbling, &c., and contain nothing to discolour the plaster, while nails can be driven with ease. Only a setting coat of plaster is required for a finished surface, which can be papered or distempered within a week of erection. The slabs have been used in a number of important buildings in London and the provinces. The address of the Acton Concrete Partition Co. is 63, Cornhill, E.C.

Automatic Electric Lifts.

Special Position No. 11, Row E.

The exhibit of Messrs. R. Waygood & Co., Ltd., of Falmouth Road, Great Dover Street, S.E., comprises direct-coupled electric-lift gear, an automatic electric dinner-lift, a hand-power lift, and car switches, push-boxes, &c. The direct-coupled electric passenger-lift is fitted with a mechanical automatic cut-off gear to prevent it travelling beyond either extremity, and also has a patent controller, enabling the lift to be operated by automatic push-buttons in the cage, so that on the pressing of a button the lift automatically starts and stops at the desired floor. The lift is also fitted with automatic buttons on the various floors for calling the lift to these floors as desired. This automatic controlling device is connected with automatic electrical and mechanical locking gear on the doors, designed to prevent the lift working so long as any door is open. This is the type of lift which is being largely adopted in private residences and is similar to one recently erected by Messrs. Waygood for the Prince of Wales at Marlborough House. The automatic electric dinner-lift is worked in a similar manner. This lift is so fitted that in the event of the shutter being open while the lift is in motion the lift will stop and so be prevented from descending on anyone who might have his head or hand in the well-hole.

Stanchions, Joists, &c.

Stand No. 111, Row F.

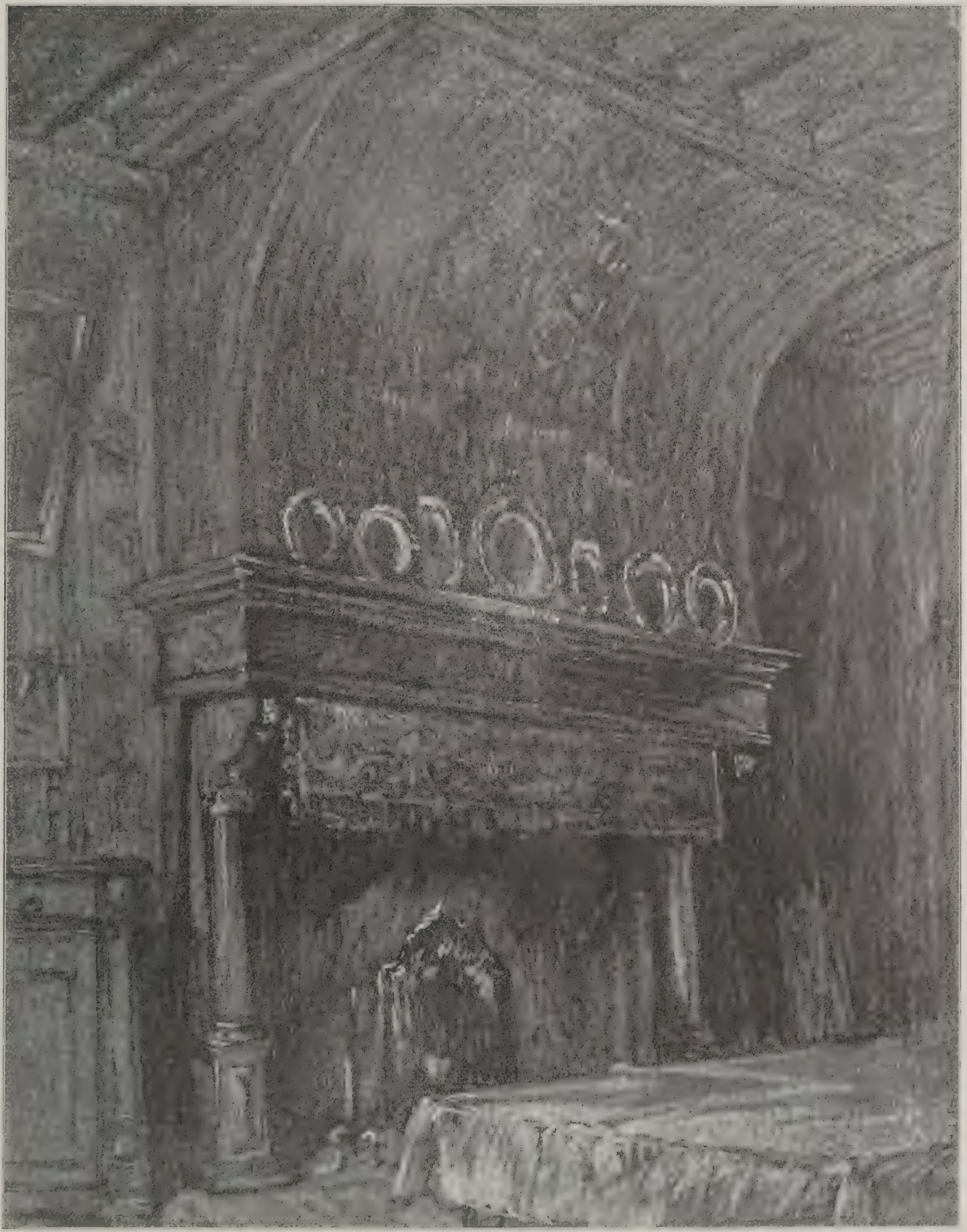
Messrs. Power's & Deane, Ransome's, Ltd., of Plymouth Wharf, Cubitt Town, E., exhibit cast-iron and solid steel stanchions of various sections and designs, roof principals, lattice girders, compound girders, and various forms of cleated connections of rolled steel joists, handrailing, anchor and lewis bolts, &c. Special attention is directed to sections of compound girders, two of which are built up of the largest- and smallest-section steel joists ever rolled.

Books on Architecture and Building.

Stand No. 43, Row B.

Mr. B. T. Batsford, the well-known publisher, of 94, High Holborn, W.C., has his publications on view, including such works as Mitchell's "Building Construction," Rea's "How to Estimate," Ellis's "Modern Practical Joinery," a new edition of Millar's "Plastering," Middleton's "Building Materials" and "House Drainage," Leaning's "Building Specification," Fletcher's "History of Architecture" and "Quantities," J. Wright Clarke's "Tables for Plumbers, &c.," Hellyer's "Plumber and Sanitary Houses," Moore's "Sanitary Engineering," Day's "Alphabets, Old and New," Adams's "Modern Cottage Architecture," Briggs's "Homes for the Country," Tanner's "English Interior Woodwork," and other important books on practical and historical architecture. Architects and builders who are not often in the neighbourhood of Mr. Batsford's premises will doubtless be interested in this exhibit.

FORMING CEILING WITH "PHOENIX" SLABS.



DRAWINGS OF ARCHITECTURE: FIREPLACE IN THE "LION DE FLANDRES," FURNES, BELGIUM, BY H. WILSON.

CELLULOID FACTORIES.

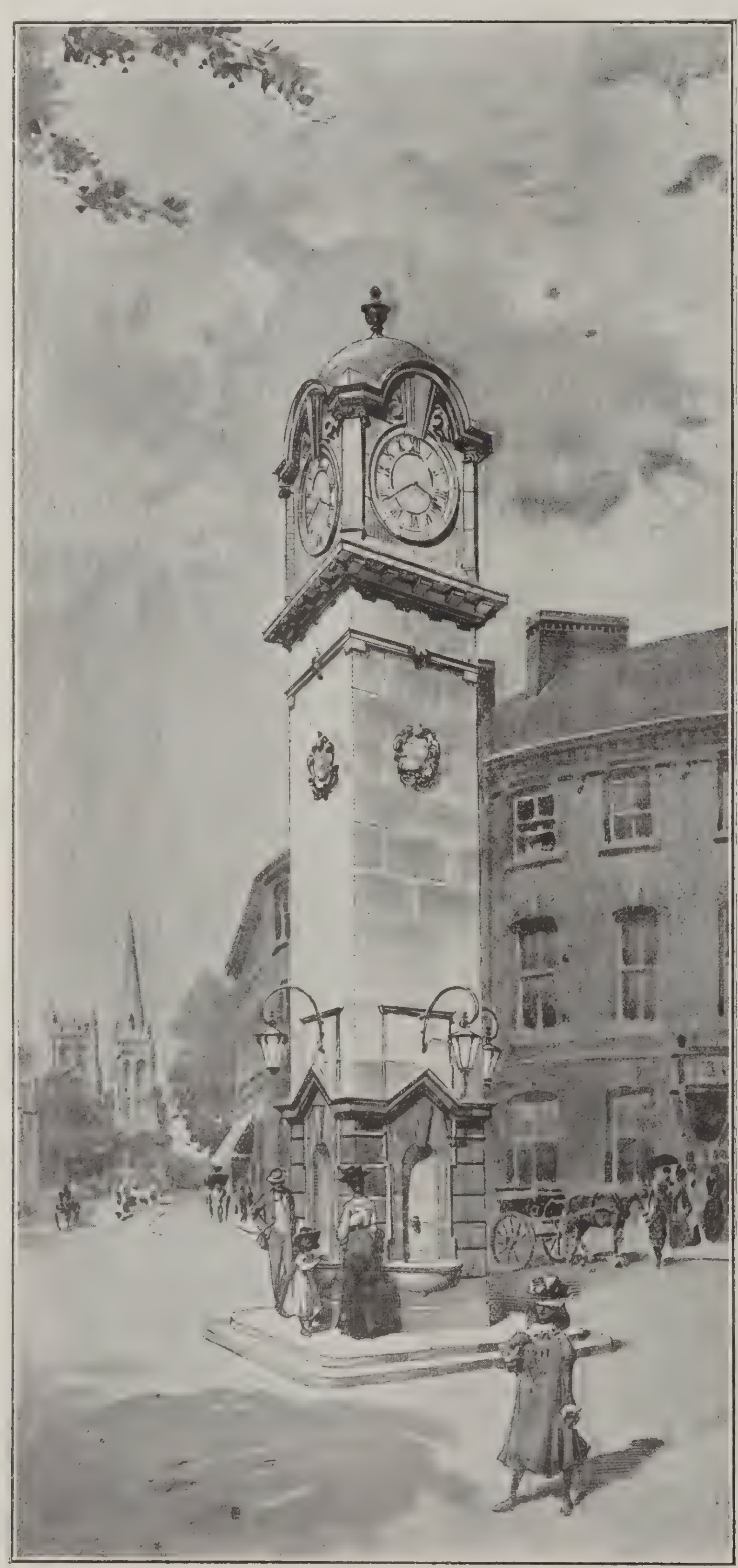
THE attention of the Factory Department of the Home Office has been directed to alleged injury to health and risks from fire in the manufacture of xylonite and celluloid, and in the use of those materials for manufacturing purposes, and it has issued a memorandum on the subject in which it is stated that it would appear that by the general observance of recognized measures of precaution, already adopted in certain works, further security may be obtained. The following observations are offered by the Home Office after an exhaustive enquiry by Commander Hamilton Smith, one of H.M. Superintending Inspectors of Factories, who has conferred with experts in the matter.

In the manufacture of the raw material, and in its subsequent manipulation, it does not appear that there is any exceptional risk so far as the health of the workers is concerned, excepting in rooms where nitric and sulphuric acids are used and necessarily give off fumes. These should be drawn away mechanically at or as near as possible to the point of generation by suitable exhaust ventilation pipes.

The risk of fire is obvious, having regard to the highly inflammable nature of the substance used. Probably only a proportion of the more serious fires, leading to casualties and loss of property, are brought to the knowledge of the department, but these have caused many fatalities. Between 1894 and 1904 the records for England alone show fifty-nine fires connected with xylonite or celluloid—fifty in the manufacture of those materials (forty-six in cutlery works at Sheffield) and nine in places in which it was stored or used.

The following precautions are recommended:—

(1) Where large quantities of xylonite or celluloid are stored fireproof rooms should be provided.
(2) Where xylonite or celluloid is used or temporarily stored the material not in actual use should be kept in metal or other fireproof receptacles.
(3) Xylonite or celluloid shavings or dust should not be allowed to accumulate on the floors, but should be swept up daily and placed in receptacles of non-inflammable material, not in the sacks or wooden boxes now commonly employed for the purpose.
(4) The use of naked lights should be avoided as far as possible; if used at all they should be at least 3ft. from any boring or glazing machine.
(5) Where cutting or sawing of xylonite is done the saw or other cutting instrument should run in water, or by other means be kept thoroughly cool.
(6) The shanks of tools used for boring the scales for table knives and forks should be of such form as to avoid friction caused by contact with the material bored.
(7) In addition to a supply of water, buckets filled with damp sand should be kept in constant readiness in every shop in which xylonite or celluloid is being worked, in order that any accidental fire may be immediately smothered before it attains serious proportions.



KING EDWARD VII. CORONATION MEMORIAL, CAMBRIDGE.
MACALISTER AND TENCH, ARCHITECTS.

Bankrupicies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

J. Fachney, plasterer, Sheringham. R.O. April 12th.

E. Rowles, builder, Pill. R.O. April 14th.

J. Bridgeman, builder, Weymouth. R.O. April 15th.

H. Crookes, builder, Sheffield. Adj. April 12th.

A. Lyons, builder and contractor, Malton. P.E., Scarborough C.C., May 2nd, at 12.

J. Picknett, bricklayer and plasterer, Redcar. R.O. April 14th.

C. J. Edwards, builder, Appex, Warlingham and Thornton Heath. R.O. April 11th.

W. H. Belcher, brick merchant, Paddington. Adj. April 12th.

H. Harris, painter and decorator, Abertillery. R.O. April 15th.

Robinson & Edwards, builders, Seaton Sluice. Adj. April 12th.

J. Brooks, monumental mason, Smethwick and Witton. Adj. April 14th.

J. E. Scott, joiner and builder, Bradford. R.O. April 11th. First meeting, O.R.'s, Bradford, April 27th, at 3. P.E., Bradford C.C., May 10th, at 10.

C. Rook, builder and contractor, Cardiff. First meeting, 117, St. Mary Street, Cardiff, April 27th, at 11. P.E., Cardiff Town Hall, May 2nd, at 11.

M. A. Lynex, builder, Walsall. First meeting, Stork Hotel, Walsall, April 27th, at 11.30. P.E., Walsall C.C., May 11th, at 11.30.

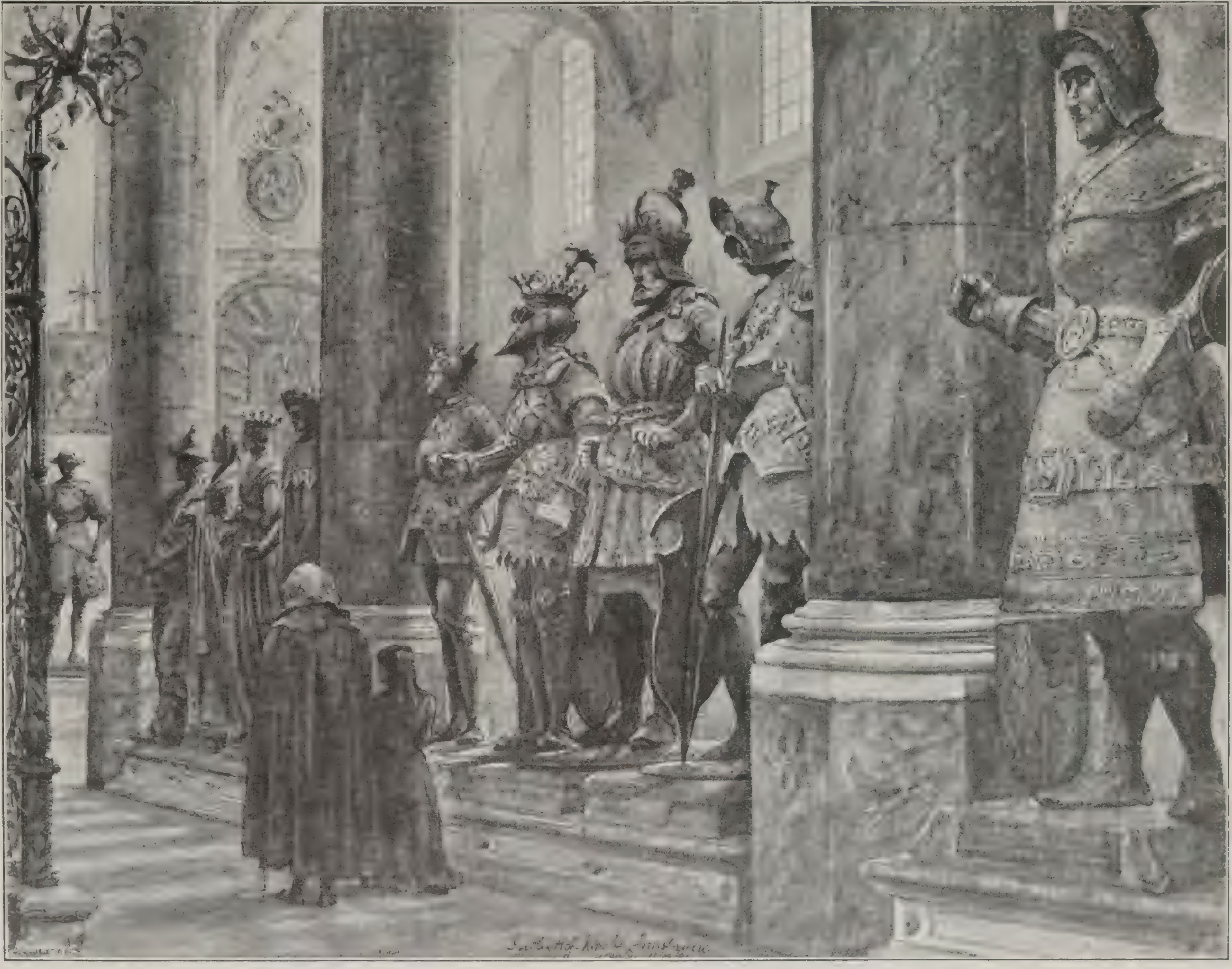
W. Dowland, builder and contractor, Sutton. First meeting, 24, Railway Approach, London Bridge, April 27th, at 11.30. P.E., Croydon C.C., May 17th, at 11.

Tatton & Fitzgerald, timber merchants, Manchester. First meeting, O.R.'s, Manchester, April 27th, at 2.30. P.E., Manchester C.C., May 15th, at 10.

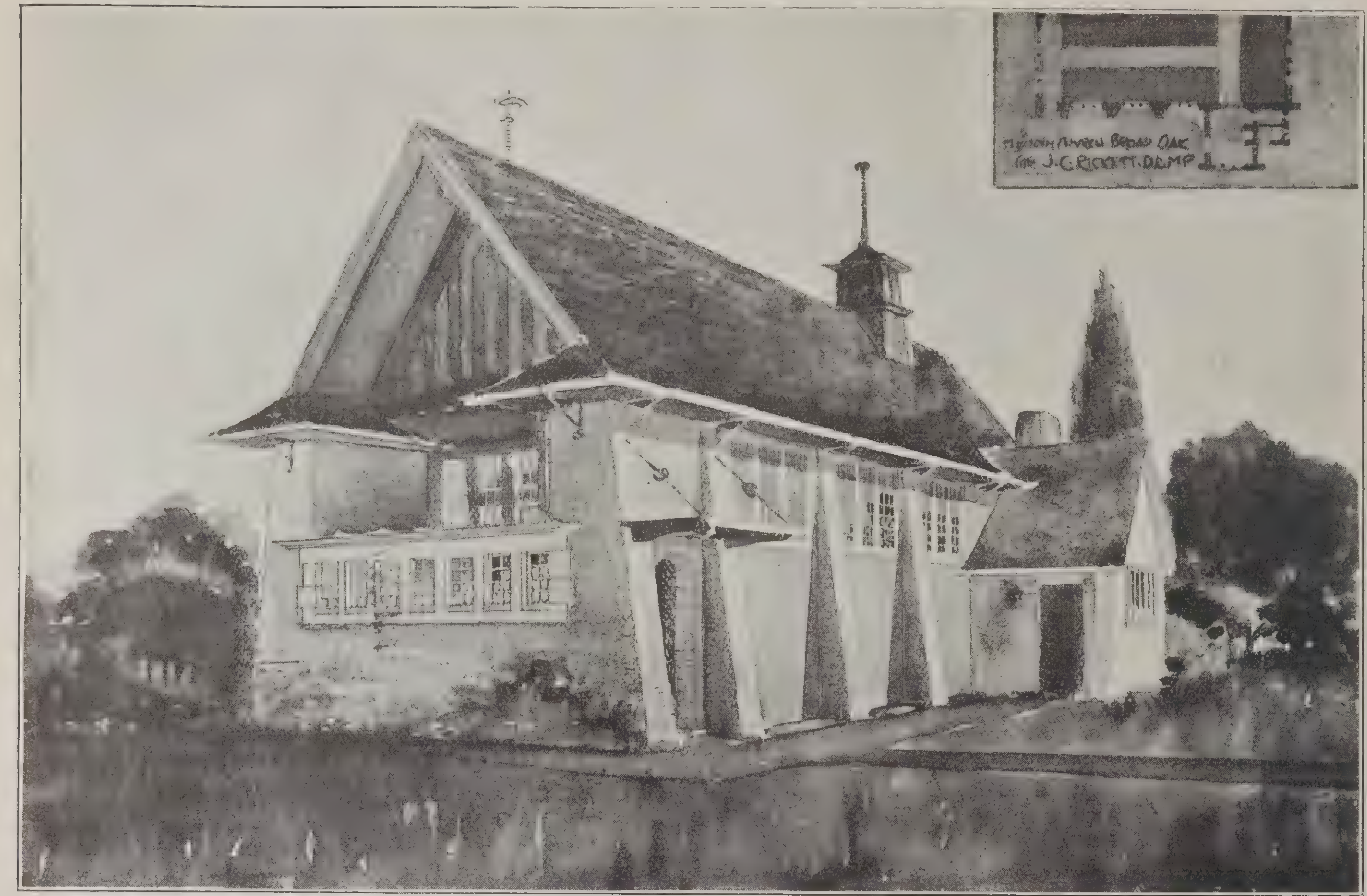
E. Harlow, builder and carpenter, Chatham. First meeting, O.R.'s, Canterbury, April 29th, at 11. P.E., Canterbury Guildhall, May 4th, at 10.

T. W. Richards, joiner and builder, Tibshelf. First meeting, O.R.'s, Derby, April 27th, at 3. P.E., Derby C.C., May 9th, at 11.

King Edward VII. Coronation Memorial, Cambridge.—This design was placed first by the assessor (Mr. J. A. Gotch, of Kettering) in a limited competition held by the Corporation of Cambridge. The memorial is proposed to be erected at the junction of the Station Road and Hills Road, where it will be visible from three principal streets of the town. The area at the disposal of the competitors was only about 7ft. square, and the cost, including clock and lights, was not to exceed £750. Messrs. Macalister & Tench, of Cambridge and London, are the architects.



DRAWINGS OF ARCHITECTURE: TOMB OF THE EMPEROR MAXIMILIAN, INNSBRUCK. BY WALTER MILLARD.



MISSION CHURCH NEAR HAILSHAM, SUSSEX. T. EDWIN COOPER, F.R.I.B.A., ARCHITECT.

Keystones.

Garden Cities in Theory and Practice.—An exhaustive treatise on this subject, by Mr. A. R. Sennett, A.M.I.C.E., M.I.M.E., M.I.E.E., is about to be issued by Messrs. Bemrose & Sons, Ltd., in two volumes of about 600 pages each, with 400 full-page half-tone plates, plans and diagrams. The price (to subscribers only) will be one guinea nett.

The Competition Reform Society disapproves of the conditions in the competitions for an isolation hospital at Windsor and secondary schools at Chepping Wycombe, the former because there is no professional assessor and the award of the board is to be final, and the latter because the remuneration is insufficient.

Agricultural Cottages Competition.—The council of the Yorkshire Agricultural Society have decided to offer prizes to the value of £120 at the Yorkshire Agricultural Show for cheap cottages erected on exhibition which afford the most space and accommodation at the most economical cost, having regard to durability. The cottages may be one or two storeys in height and any materials may be used.

The Restoration of St. William's College, York, one of the most ancient and most interesting buildings in the city, has now been commenced, but such is its extremely dilapidated condition that three years may elapse before it will be fully available for the purpose for which it is being restored, namely, the holding of the meetings of the Houses of the Convocation of York. As far as possible the place will be restored to its ancient appearance. Every part of the old oak panelling which it is requisite shall be removed from the walls is numbered and indexed on the plans, so that when the work in the rooms has advanced to the proper stage the panels may be replaced each in its original situation. That principle of replacement of ancient material is to be observed throughout, even to replacing the little panes of the windows, and where half a beam is good that half will be retained.

A WORLD-FAMOUS BRIDGE WORKS.

A VISIT to Sir William Arrol & Co.'s Bridge Works, Glasgow, was recently paid by the Aberdeen Association of Civil Engineers. Attention was first drawn to the "template" floor, where the whole of the bridge work is drawn out on the floor full size from the drawings and the templates of timber made for distribution to the bridge yard. This avoids all mistakes when the work comes finally to be put together. In this way the great bridges built by the firm were drawn out before construction, including such structures as the Tay, Forth and Tower bridges, and the visitors were fortunate enough to see one of the large girders for the bridge over the Nile at Cairo lying in template on the floor ready to go to the bridge shops.

The large smithy shops and engine shops were next carefully examined, and much interest was exhibited in the special hydraulic machinery in the smithy for bending the steel bars and plates into shape in a single operation.

Amongst other work in the bridge yards were to be seen the steel foundations of the large new railway bridge over the Wear at Sunderland, bridges for the Egyptian railways, and the steelwork of the large new road bridge over the Nile at Cairo, which alone is estimated to cost nearly £250,000. These works were in different stages of manufacture, and gave a clear insight into the manner in which such work is prepared.

A visit to the spacious drawing offices proved not the least interesting part of the round, as numerous drawings of the work in hand had been carefully selected and laid out for inspection.

Builders' Notes.

The Builders' Exchange and Exposition, Birmingham, which is to be opened on May 17th, is to be a permanent exhibition where all classes of machinery and materials for the building trades will be shown. The building is in High Street, facing New Street. Thursday is the Exchange Day.

Manchester Builders Busy.—The number of houses in course of erection in and around Manchester is almost without parallel in the history of the city. In one suburb—Gorton—plans have recently been passed providing accommodation for 10,000 persons, while in Cheetham 800 houses are being built upon one estate.

Dublin Building Trade Dispute.—The men have accepted Alderman Cotton as arbitrator between themselves and the master-builders in respect of the addendum to one of the rules, which is the cause of the lock-out. This addendum is as follows:—The master-builders are to get every advantage given by the members of the Society to others not members of the Master-Builders' Association, and where work is done by measurement or agreement by such persons the master-builders to have the right to claim a similar advantage.

OUR PLATE.

THE stables at Gallops Homestead, Plumpton, Lewes, were built some time ago. The accommodation at ground level is shown by the plan. On the first floor are living-rooms and a loft. The walls are faced externally with a local red brick, parts being tile-hung, and the roofs are covered with wheat-straw thatch. The architect was Mr. C. H. B. Quennell, of London, and the builder was Mr. W. Oram.

Current Market Prices.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0	1	3	0
Clover, best	per load	3	15	0	4	2	6
Hay, good	do.	3	10	0	3	15	0
Sainfoin mixture ...	do.	3	10	0	3	17	6
Straw	do.	1	12	0	2	0	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ...	per cwt.	1	0	5		—	
Colza Oil, English ...	do.	1	2	3		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0		—	
Linseed Oil, barrels ...	per cwt.	0	17	1½		—	
Petroleum, American ...	per gal.	0	0	5⅛		—	
Do. Russian ...	do.	0	0	4⅝		—	
Pitch	per barrel	0	8	0		—	
Shellac, orange	per cwt.	7	10	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	4	0		—	
Tar, Stockholm	per barrel	1	6	6		—	
Turpentine	per cwt.	2	4	0		—	

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ...	per ton	82	0	0		—	
Iron, Staffs., bar ...	do.	5	17	6	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	5	0		—	
Lead, pig, Soft Foreign...	do.	12	13	9		—	
Do. do. English common brands	do.	12	18	9		—	
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14	0	0		—	
Do. pipe	do.	15	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	5	0		—	
Do. floor brads... ...	do.	9	0	0		—	
Steel, Staffs., Girders and Angles	do.	5	5	0	6	0	0
Do. do. Mild bars ...	do.	6	0	0	6	5	0
Tin, Foreign	do.	141	10	0	142	0	0
Do. English ingots ...	do.	137	10	0	139	0	0
Zinc, sheets, Silesian ...	do.	28	0	0		—	
Do. do. Vielle Montaigne	do.	29	0	0		—	
Do. Spelter	do.	23	10	0	23	16	3

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Whitewood, American, logs.	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	3	0
Fir, Dantzic and Memel	per load	2	7	6	4	15	0
Pine, Quebec, Yellow ...	do.	4	5	0	7	5	0
Do. Pitch, American	do.	2	8	0	5	15	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, Nederkalix, Yellow, 1st, 4×10	per std.	10	15	0	11	0	0
Do. Archangel, Yellow, 2nd, 3×9	do.	14	10	0		—	
Do. do. do. 4th, 3×11	do.	7	15	0		—	
Do. do. do. do. 3×9	do.	8	15	0		—	
Do. do. White, 2nd, 3×11	do.	10	5	0		—	
Do. Umba, Yellow, 3rd, 3×11	do.	9	0	0		—	
Do. Kem (White Sea), Yellow, 3rd, 3×9	do.	11	5	0		--	
Do. Petersburg, Yellow, 1st, 3×9	do.	11	5	0	13	15	0
Do. do. do. Unsorted, 3×9	do.	10	5	0		—	
Do. do. White, 1st, 3×9	do.	9	10	0		—	
Do. Kovda, Yellow, 3rd, 3×9	do.	10	15	0		—	
Do. Kemi, Yellow, 1st and 2nd, 3×9	do.	10	15	0	11	0	0
Do. Skelleftea Yellow, 3rd, 2½×8	do.	8	10	0		—	
Deals, Montreal, Yellow, pine, 1st, 3×11 & 12ft.×13ft. ...	do.	22	15	0		—	
Do. do. do. do. do. 3×11×14ft.	do.	22	0	0		—	
Do. do. Spruce, 2nd, 3×9	do.	8	15	0	9	5	0
Do. Quebec, Spruce, 3rd, 3×9	do.	9	0	0		—	
Battens, all kinds ...	do.	6	5	0	13	10	0
Flooring Boards 1in. prepared, 1st... ...	per square	0	10	0	0	10	0
Do. 2nd	do.	0	7	9	0	10	6
Do. 3rd, &c.	do.	0	6	3	0	8	6

HARD WOODS.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	4	0	0	7	10	0
Birch, New Brunswick...	do.	2	10	0	5	5	0
Do. Quebec do. ...	do.	2	10	0	6	0	0
Box, Turkey	per ton	7	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	3½	0	0	3½
Do. Honduras ...	do.	0	0	3		—	
Do. Tobasco	do.	0	0	$4\frac{25}{32}$		—	
Elm, Quebec	per load	4	2	6	8	15	0
Jarrah, planks	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras...	per ft. sup.	0	0	$4\frac{7}{32}$	0	0	$4\frac{13}{16}$
Do. African ...	do.	0	0	$2\frac{31}{32}$		—	
Do. St. Domingo	do.	0	0	4		—	
Do. Cuba ...	do.	0	0	$3\frac{29}{32}$		—	
Do. Lagos ...	do.	0	0	4		—	
Do. Benin ...	do.	0	0	$2\frac{21}{32}$		—	
Do. Tobasco ...	do.	0	0	$5\frac{13}{16}$		—	
Oak, Wainscot	per log.	2	12	6	5	15	0

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Architects and Surveyors' Societies.

BRIGHTON. — NIMAJNEB writes: "Please name the principal architects' and surveyors' societies, with information as to where particulars and conditions of membership can be obtained."

The Royal Institute of British Architects (9, Conduit Street, London, W.), the Architectural Association (18, Tufton Street Westminster), the Society of Architects (Staple Inn Buildings, Holborn W.C.), the Royal Institute of the Architects of Ireland (63, Dawson Street, Dublin); the Surveyors' Institution (Great George Street, Westminster). For particulars apply to the secretaries at the addresses stated.

Scantling for Steel Rafter.

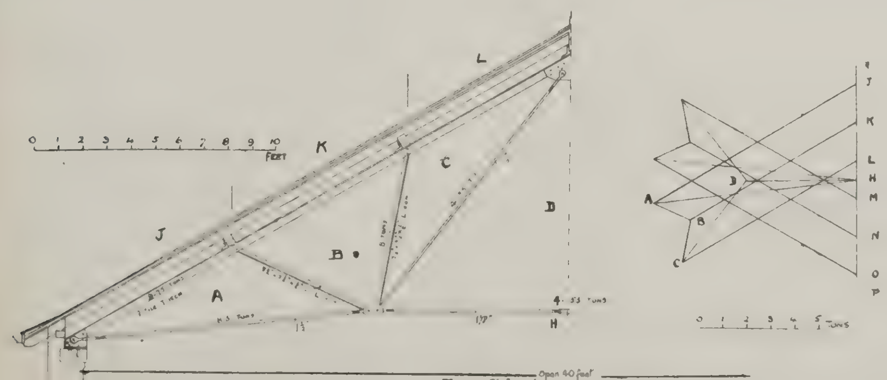
WATFORD.—T-IRON writes: "Please state size of principal rafter of wrought-iron truss. As shown by tracing (reproduced below), the roof is to be slated, battened and boarded. Distributed load taken at 56lbs. per ft. super., sloping surface, including 30 lbs. vertical wind load; trusses 8ft. apart. By Gordon's formula a $5\frac{3}{4} \times 3\frac{3}{4} \times \frac{5}{8}$ T-iron seems insufficient —taking $\frac{a}{2}$ for one end only fixed—but as a strut, when $\frac{\text{length}}{\text{least width}} = 25$, this size is far beyond requirements."

There must be something wrong about your calculations, as Gordon's formula applied to the principal rafter of a roof or to a strut is the same. The coefficient a applies to a member fixed at both ends and $\frac{1}{2}$ a to a member fixed at one end and rounded or pivoted at the other. The principal rafter of a roof is generally taken to be of the latter class, and a strut may be either, or may even be pivoted both ends, but the latter is unusual. Hurst's "Architectural Surveyors' Handbook" gives $4\frac{3}{4} \times 3\frac{1}{2} \times \frac{5}{8}$ tee as the size for a roof of 50ft. span, when the rafter is divided into three bays. Taking this size, the strength by Gordon's formula will be

$$w = \frac{fs}{1 + \frac{l^2}{\frac{1}{2}ad^2}} = \frac{30 \times 4\cdot75}{1 + \frac{1}{750}\left(\frac{84}{3\cdot5}\right)^2} = \frac{142\cdot5}{1\cdot768} =$$

80·6 tons. As the maximum stress is 9·75 tons the factor of safety will be $\frac{80\cdot6}{9\cdot75} = 8\cdot26$.

HENRY ADAMS.



SCANTLING FOR STEEL RAFTER.

Sewage-disposal System for Country House.

D. S. writes: "About three years ago a country house was provided with a sewage-disposal system as shown in the accompanying sketch (not reproduced). The scullery and pantry sinks discharge into large grease intercepting gulleys of the usual and somewhat out-of-date type, and are cleaned out once a week. The drainage is from house and stables. The cesspool (in existence for six years) has never been cleaned out, but there is no sludge in it, the contents being completely liquified. The filter beds are worked alternately in pairs, with rests of about a week. The large beds have been covered in with hinged close-boarded covers to exclude leaves, &c. The filter has never worked well, and for months past has been completely choked up with a black slime which looks like grease. The sewage now passes through the overflow pipes without any change in its character. I shall be glad to know (*a*) why the system does not work in a satisfactory manner; (*b*) what is the best way to improve the existing system, regardless of cost; (*c*) what is the best way to improve the existing system if the cost has to be considered; and (*d*) what is the most automatic system for country houses, giving a good effluent."

(*a*) The contact bed is wrongly constructed, due to some misapprehension as to the bacteriological method of purification. In the present case you have a cesspool acting as a septic tank and breaking up the solids. But if the septic or anaërobic process is adopted—and in small installations it is imperative—it must be followed by the aërobic process, or treatment by the bacteria that require plenty of air. Your filter bed in this instance has a close-boarded cover; it is practically air-tight, and so far from being an aërobic contact bed is now, more probably, a second septic tank. It is not surprising to hear that it is choked up. The septic tank also may not be large enough to contain the day's flow of sewage. It must be borne in mind that the sewage should be held up a day in the septic tank before being passed on to the contact beds. (*b*) The contact bed must be cleaned out and the cover done away with. The bed material would be better of coke alone, of the size of a walnut or a little larger, and without any dust. It should be set on a flooring of expanded metal fixed 2ins. above the floor or on patent filter tiles, so that there is a clear space under for the water to drain away. The flooring should be easily removable for cleaning purposes. We presume that the sewage can be held up in the septic tank until there is sufficient to fill the contact bed. Contact beds should always be filled quickly, so that as much air may be imprisoned in the porous material as possible. After a charge the filter must be allowed to aërate for some hours. (*c*) Same as last. The system must follow the rules. (*d*) This depends on the size of the installation. Several firms (such as Messrs. Adamsez, &c.) have an automatic apparatus for small installations.

Bending Moment on Beam.

GLASGOW.—SCOTSMAN writes: "Please explain how to find the bending moments for the following:—A beam is supported at both ends and has a distributed load, also a fixed load 10ft. from one end. Length of beam 25ft. I can find the moments by graphics, but want to prove it by mathematics."

Let A B (Fig. 1) be the beam in question, w the load per foot-run in cwts., l the span in feet, x and y the segments into which the concentrated load W divides the span. Then the maximum bending moment from distributed load, or ordinate to centre of parabola (Fig. 2) $= \frac{wl^2}{8}$, and the ordinate of parabola at y distance from B $= \frac{wy}{2}(l - y)$. The maximum bending moment from the concentrated load, or ordinate to apex of triangle $= \frac{Wxy}{l}$. The maximum combined bending moment will therefore be $\frac{wy}{2}(l-y) + \frac{Wxy}{l}$. Should a tangent to the parabola make an angle with the horizontal more than B A D, then the ordinate of maximum bending moment must be taken a little nearer to A.

HENRY ADAMS.

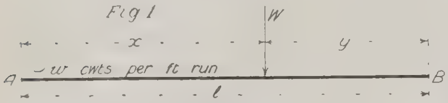


Fig 1

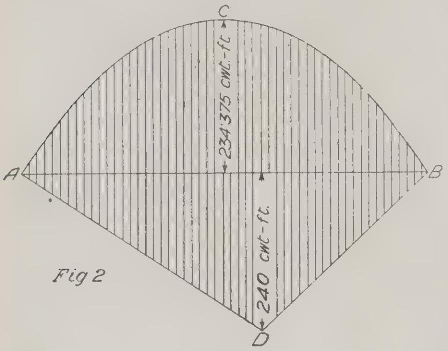


Fig 2

Strength of Reinforced Concrete Beam.

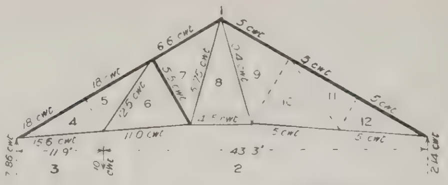
COLCHESTER.—E. A. G. writes: "In your issue for February 8th, in answer to an enquiry by 'Studio,' it was stated that 500lbs. per sq. in. compressive working stress is about four times too high for concrete, for safety. In the case worked out in your columns the load of $9\frac{1}{4}$ tons appears to me to give a maximum unit stress of 9 cwts. instead of about 125 lbs. My working is as follows: Assume that sufficient steel is inserted to make up for want of tensile strength of concrete, and that the reinforced beam can be calculated as if composed of materia of the same tensile as compressive strength; or moment of resistance $= \frac{sbd^2}{6}$ where s = unit compressive strain, $\frac{sbd^2}{6} = \frac{WL}{8}$, or s =

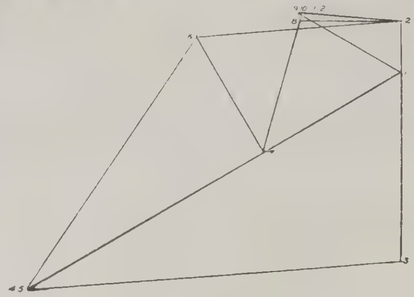
$$\frac{WL \times 6}{8 \times 6 \times d^2} = \frac{\overset{\text{tons}}{9\cdot25} \times \overset{\text{length}}{9\cdot25} \times 12 \times 6}{8 \times 12 \times 12 \times 12} = \frac{85\cdot56}{1\cdot92} =$$

·45 tons approximately 9 cwts. As the subject is one of interest to most of your readers perhaps you would be good enough to reply to the above."

The suggested mode of working out the strength is vitiated by two errors. First the lintel is calculated as if it had no reinforcement, and second, the coefficient s is not "unit compressive strain," but the "modulus of rupture," or "coefficient of transverse strength." The subject may perhaps be better understood after perusal of the article on p. 218.

HENRY ADAMS.





Hanging Additional Load to Roof-truss.

GLASGOW.—ANNUAL SUBSCRIBER writes: "I send a drawing of a portion of steel roof-truss, and on it are marked the stresses as found by diagram for wind-pressure and weight of roof, with the scantlings proposed. It is now intended to hang a moving load of $\frac{1}{2}$ ton where shown. What will be the additional stress caused to the members and how can it be found?"

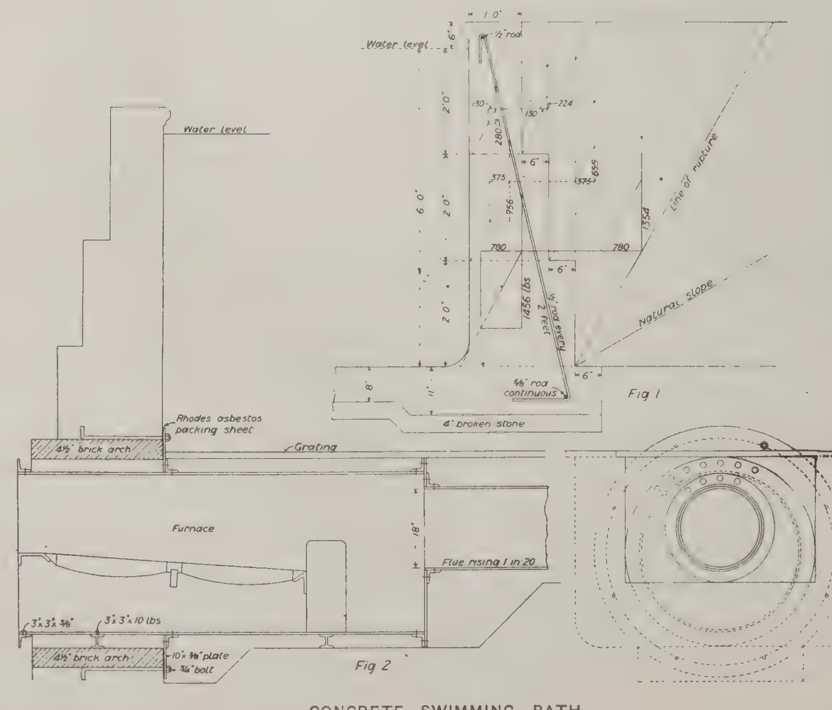
The accompanying frame and stress diagrams show the additional stresses on truss caused by the live load of $\frac{1}{2}$ ton acting at joint of first bay as required. The nature of the stress is shown by the lines—thick for compression, thin for tension, and dotted for no stress.

Concrete Swimming-baths.

FILEY.—R. W. S. writes: "Please give your opinion on the stability of a wall around a proposed swimming-bath. Do you think the method of heating the water shown by the accompanying sketch (re-drawn) is an economical and practicable one? Careful provision has been made that no strains due to the expansion of the furnace or flue come upon the concrete."

The section of proposed wall is shown in Fig. 1, where the resultant stress is given at each set-off, assuming the bath to be empty. This indicates that the wall requires reinforcement, which may be done by iron or steel rods inserted as shown, cleaned and painted with cement-wash before being put in, and the concrete well mixed and rammed. The furnace may be flush with face of wall in stoke-hole or projecting 3ins., as shown in Fig. 2, with ordinary cast-iron front. The size of furnace, &c., may be determined as follows:—Temperature of water to be raised, say, 20 degs. = 20 units of heat per lb. of water, $20 \times 62\frac{1}{2} = 1{,}250$ units of heat per cub. ft. of water, while 1lb. coal contains 13,000 heat units, of which, say, 10,000 can be utilized. Swimming-bath contains 5,415 cub. ft.; therefore $1250 \times 5415 = 6{,}768{,}750$ units of heat required. Then $\frac{6768750}{10{,}000}$, say 680 lbs. coal to heat water. Furnace 3ft. × 5ft. 6ins. = 16·5ft. area, say 5 lbs. coal burnt per sq. ft. firegrate per hour; then $16\cdot5 \times 5 = 82\cdot5$ lbs. per hour total quantity of coal burnt, and $\frac{680}{82\cdot5}$ = say 8 hours to heat bath from cold water. The area of a flue should be $\frac{1}{5}$ the firegrate area, but the chimney may be as little as $\frac{1}{10}$ the firegrate area, $\frac{16\cdot5}{5} = 3\cdot3$ sq. ft. area of the flue for this furnace; but a 10in. pipe only is shown; this is altogether inadequate; nothing less than one of 18ins. diameter would be suitable, $18^2 \times \cdot7854 = 1\cdot77$ sq. ft. area, and $\frac{16\cdot5}{1\cdot77} = \frac{1}{10}$ nearly. The weight of this would be about $\frac{1}{2}$ cwt. per ft. run, while the water displaced would be about 1 cwt. per ft. run, so that not only must provision be made for carrying the weight when the bath is empty but also to resist the floating tendency when the bath is filled. The joint at wall next to chimney-shaft may be arranged similarly to that shown for the furnace shell at the other end. The chimney shaft should not be less than 50ft. high, unless a Sturtevant induced draft fan is applied at the base. It is not clear why you want 4ins. of broken stone below the concrete; it may be to give a gathering ground for your land drains, but the work would be more solid without it, and as the subsoil is stated to be dry hard clay, it is not clear why any drainage is required. Before the work is put in hand it should be well considered and an estimate of cost obtained. An alternative scheme would be to have boiler and chimney at the deep end with the water passing into the boiler through a pipe from the bottom of the bath and out of the boiler, after heating, through a pipe near the top of the bath. This would probably be very much cheaper and more efficient.

HENRY ADAMS.



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Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Bromley.—For the erection of the Bromley and Beckenham Small-pox Hospital. Mr. John Ladds, architect, 93, Pemberton Road, Harringay, N. Quantities by Messrs. Alfred Boxall & Sons, 8, Adam Street, Adelphi:—

Sturry Building Co., Canterbury ...	£14,484	3	8
Gathercole Brothers, Norbury ...	13,784	0	0
Denny & Son, Deal	12,881	0	0
Leslie & Co., London	12,832	11	3
C. Corben, Maidstone	12,233	0	0
R. Lowe, Chislehurst...	12,227	0	0
Lovatt & Co., Kensington	12,215	0	0
Spencer, Santo & Co., London ...	12,172	0	0
W. H. Hyde, Norwood Junction ...	12,113	10	0
Ennis Brothers, Erith	11,884	0	0
Norris, Beckenham	11,879	0	0
Lonsdale, Swanley Junction	11,868	0	0
Knight, Sidcup	11,753	0	0
Perry & Co., Bow	11,672	0	0
Parker, Peckham...	11,582	0	0
Podger & Son, Bromley	11,580	0	0
T. D. Graty, Bromley	11,397	0	0
Martin, Wells & Co., London ...	£11,380	0	0
Wallis & Sons, Maidstone	11,248	0	0
Oak Building Co., Cambridge ...	11,175	4	0
J. Smith & Sons, South Norwood...	11,163	0	0
F. G. Minter, Putney...	11,006	0	0
C. Brightman, Watford	11,000	0	0
Kirk & Randall, Woolwich	10,924	0	0
W. Smith & Sons, Croydon	10,823	0	0
Miskin, Gravesend	10,814	3	10
W. Lawrence & Son, Waltham			
Jones & Andrews, Beckenham ...	10,685	14	8
Cross	10,674	0	0
Nash, Deptford	10,609	0	0
T. J. Hawkins, Whitehill, Hants ...	10,585	8	3
Somerford & Son, Clapham	10,532	0	0
Sharpington, Nunhead	10,422	0	0
W. Wallis, Balham	9,822	0	5
A. Coles, Plymouth	9.815	13	7
Blay,* Dartford	9,684	18	1

* Accepted subject to satisfactory references and the approval of the Local Government Board.

Cardiff.—For the erection of artizans' dwellings at Wellington Street, Canton. Mr. W. Harpur, M.I.C.E., borough engineer:—

J. H. Maggs & Co., Romilly Crescent	£3,609	0	0
G. Griffiths & Son, Working Street	3,282	0	0
G. Burgess, Sneyd Street	3,050	0	0
C. C. Dunn, Cowbridge Road	3,000	0	0
North & Stephens, Brunwick Street	2,974	7	5
Knox & Wells, Bangor Street	2,750	0	0
W. C. Ransom, Whitchurch Road...	2,700	0	0
W. T. Morgan, Fair Oak Road ...	2,700	0	0
T. C. Clouter, Marlborough Road ...	2,600	0	0
J. H. Venning, 59, Mackintosh Place	2,595	5	10
J. Blight, 47, Cwmdare Street	£2,280	0	0
F. Bond, 26, Leckwith Road	2,240	0	0
F. Small,* Godfrey Street	2,175	0	0

[Borough engineer's estimate, £2,300.]

* Accepted.

East Molesey.—For the erection of a house and premises, for Mr. C. W. Kent. Mr. D. G. Andrew. architect Bridge Road, East Molesey:—

E. Potterton, East Molesey	£1,920
Brade, Pater & Co., Cheapside and Claygate	1,649
R. Atkinson, Norbiton	1,560
J. Nibblethwaite, Twickenham	1,533
Bailey & Fry, Chiswick	1,450
Butt Brothers, Bishopsgate, E.C.	1,425
Wheatley & Sons, Ltd., East Molesey ...	1,337
J. H. Tanner, Teddington	1,250

Great Yarmouth.—For the erection of new higher elementary schools for 820 children, for the Education Committee. Messrs. Olley & Haward, architects, Great Yarmouth:—

R. Eastoe	£13,697	10	0
Carter & Wright	13,499	0	0
Moore & Son...	13,150	0	0
Hawes & Son	12,900	0	0
G. W. Beech	12,879	0	0
A. Gunns	12,449	0	0
G. Chasteney	12,429	0	0
Youngs & Son	12,397	0	0
F. Grimble	12,270	0	0
J. D. Harman	12,199	0	0
Spencer, Santo & Co.,* Felixstowe	11,596	4	8

* Accepted. [Architect's estimate, £11,550.]

(*Continued on* p. xxxvi.

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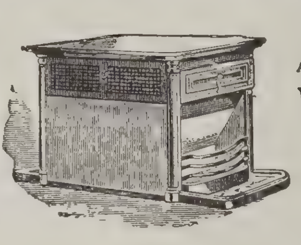

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Makers: **E. NEWTON & Co., 63, Aldermanbury, London, E.C.**

TENDERS – *cont. from p.* xxxiv.

Coventry.—For pulling down old premises and the erection and completion of new shops, houses, &c., for the Coventry Co-operative Society, Ltd. Messrs. Harrison & Hattrell, architects, 23, Hertford Street, Coventry :—

R. Wootton, White Street	£1,695	0	0
C. G. Hill, Godival Street	1,675	0	0
C. Haywood, Gosford Street	1,674	10	0
R. Cleaver, Wood Street, Northampton	1,650	0	0
Lord, Wolston	1,635	0	0
Hancox & Co., St. Patrick's Road	1,633	0	0
Exors. of the late C. Garlick, Far Gosford Street	1,620	0	0
Kelley & Sons, Little Heath, Foleshill	1,605	10	6
Worwood, Much Park Street	1,597	0	0
A. A. Wincott, Foleshill Road	1,595	0	0
Ault, Spon Street	1,569	0	0
Goode & Shaw, Bishop Street	1,555	0	0
Bowles & Son, 8, Gladstone Street, Leicester	1,550	0	0
F. Harris, Cope Street	1,500	0	0
C. Blockley,* Stoke	1,442	3	3

* Accepted. [Rest of Coventry.]

London, S.W.—For additions to Messrs. Cox & Co.'s Bank, 16, Charing Cross, S.W. Mr. H. Ling, architect, 31, Charing Cross. Quantities by Mr. G. Jackson, 9, Lebanon Gardens, S.W. :—

Hayward & Son	£2,697
Hollingsworth	2,580
Holloway Brothers	2,120
Colls & Sons*	2,112

* Accepted.

London W.—For the enlargement and improvement of Portobello Road School, Kensington, for the London County Council Education Committee :—

C. Wall, Ltd., Chelsea	£9,110
F. T. Chinchen & Co., Kensal Green	9,089
General Builders, Ltd., Notting Hill	8,896
Leslie & Co., Ltd., Kensington Square	8,409
C. F. Kearley, 195B, Kensington High Street	7,827
Rice & Son, 15, Stockwell Road	7,821
Lathey Brothers, Battersea	7,815
Lawrance & Sons, City Road	7,804
Patman & Fatheringham, Ltd., Islington	7,781
J. Simpson & Son, 48, Paddington Street	7,663
Stimpson & Co., Battersea	7,590
E. Triggs, Clapham	£7,580
W. Johnson & Co., Ltd., Wandsworth Common	7,492
J. & M. Patrick,* Point Pleasant, Wandsworth	7,290

* Recommended for acceptance.

Newbury.—For pulling down and rebuilding premises in Cheap Street, for the Governors of St. Bartholomew's Hospital and Grammar School. Mr. Walter H. Bell, architect, The Market Place, Newbury :—

H. W. Godwin, Reading	£1,910	0	0
Hoskings Brothers, West Mills	1,475	0	0
G. Head, Burghclere, Newbury	1,461	10	0
Elms & Sons, Pound Street	1,453	11	6
Kingerlee & Sons, Queen Street, Oxford	1,387	0	0
A. J. Chivers, Cheap Street	1,340	7	0
A. Brazier,* Pound Street	1,298	0	0

* Accepted.

Pontefract.—For the erection of three shops, offices, and workrooms, for the Pontefract Industrial Co-operative Society. Messrs. Garside & Pennington, architects, Pontefract :—

Gill & Sons, Doncaster	£1,327	0	0
T. H. Moberley, Tadcaster	1,305	0	0
R. Walker & Sons, Castleford	1,238	9	0
G. Spurr	1,233	14	3
Walker & Ward	1,128	14	0
Thompson & Sons, Sherburn	1,127	13	0
Jackson & Dimberline, Goole	1,125	0	0
H. Gundill	1,076	11	0
A. A. Askam & Others*	1,009	1	0

* Accepted. [Rest of Pontefract].

Tewkesbury.—For the erection of an elementary school, for the Education Committee of the Gloucester County Council. Mr. M. H. Medland, county architect, 15, Clarence Street, Gloucester :—

Estcourt, Gloucester	£3,659	0	0
Williams, Gloucester	3,650	0	0
Drew, Chalford, Stroud	3,495	0	0
Wilkes, Hereford	3,359	0	0
Draper & Wallington, Gloucester	3,220	0	0
J. W. Howell, Tewkesbury	3,190	0	0
Bowers, Hereford	3,180	0	0
Colborne, Swindon	3,119	17	0
Collins & Godfrey,* Tewkesbury	2,798	0	0

* Accepted subject to approval of the Education Committee.

(*Continued on* p. xxxviii.)

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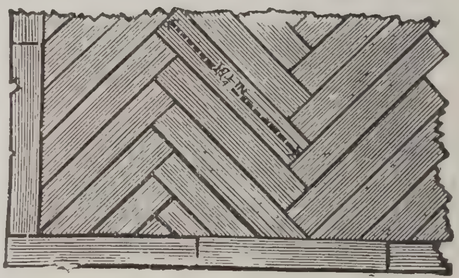

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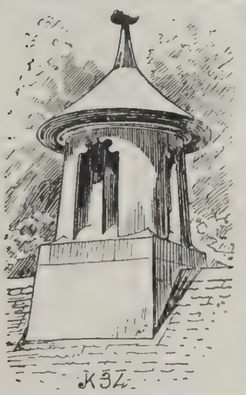

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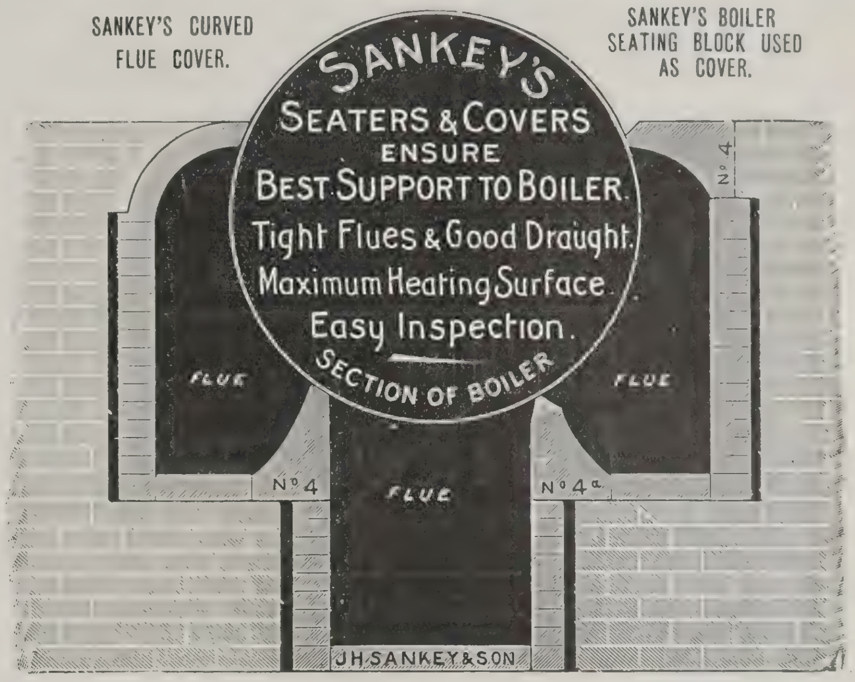

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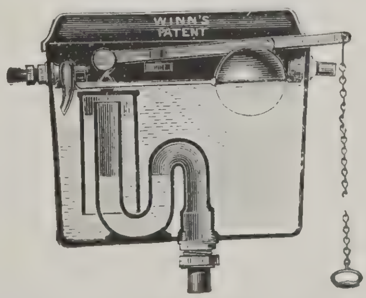

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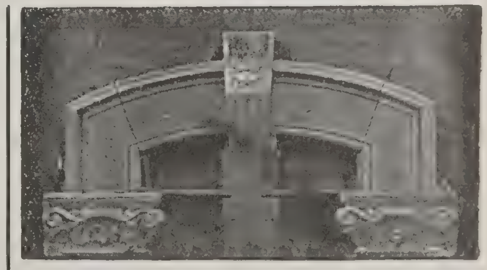

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TENDERS—*cont. from p.* xxxvi.

Maidstone.—For builders' work, &c., in reconstruction of the internal fittings of the Crown Court, Sessions House. Mr. F. W. Ruck, county architect:—

G. McKenzie & Co., Ltd., Battersea	£2,307	13	0
Wallace & Co., Ltd., Curtain Road, E.C.	2,120	16	10
Fire Resisting Co., Ltd., Fulham	1,714	18	0
Goodhall, Lamb & Heighway, Ltd., Manchester	1,677	0	0
Cox Brothers	1,635	0	0
G. Wallis & Sons, Ltd.	1,568	0	0
Lascelles & Co., Bunhill Row, E.C.	1,480	0	0
Corben & Co.	1,378	0	0
R. Avard	1,362	0	0
G. Pearce & Sons	1,272	0	0
Barden & Head	1,270	0	0
L. Seager, Sittingbourne	1,245	0	0
Elmore & Sons	1,197	10	0

Whitstable.—For the enlargement of police-station. Mr. F. W. Ruck, county architect, Maidstone:—

G. H. Denne & Son, Deal	£2,590
Stoory Building Co., Ltd., Canterbury	2,500
G. E. Wallis & Sons, Ltd., Maidstone	2,468
H. J. Smith, Maidstone	2,398
R. Avard, Maidstone	2,383
Pearce & Sons, Maidstone	2,350
T. W. Porter, Canterbury	2,349
G. Browning, Canterbury	£2,348
W. W. Martin, Ramsgate	2,300
Amos & Foad, Whitstable	2,280
E. Fuller & Son, Faversham	2,200
Gann & Co.,* Whitstable	2,189

* Accepted.

Wimbledon.—For the erection and completion of a residence, for Mr. E. Seton Scott. Messrs. W. E. Tutt & Co., architects and surveyors, 18, Ironmonger Lane, E.C.:—

E. J. Saunders & Co.	£2,935
Leslie & Co., Ltd.	2,689
Higgs & Hill, Ltd.	2,640
J. W. Brooking	2,573
J. Shelbourne & Co.	2,484
Knight & Son	2,381
Patman & Fotheringham, Ltd.	2,373
W. H. Lorden & Son	2,369
J. Appleby & Sons	2,300
G. Neal	2,290
Turtle & Appleton	2,245
J. Burges & Sons	2,200

The new Marine Hotel at Elie is being completed. Messrs. J. Burnet & Son, of Glasgow, are the architects, and Messrs. J. J. & P. M'Lachlan the builders.

Coming Events.

Thursday, April 27.

ROYAL SANITARY INSTITUTE.—Inspection and Demonstration at the Metropolitan Cattle Market, York Road, N., at 2 p.m.

Saturday, May 6.

NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to Armstrong College, Newcastle-on-Tyne.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to Niddrie House.

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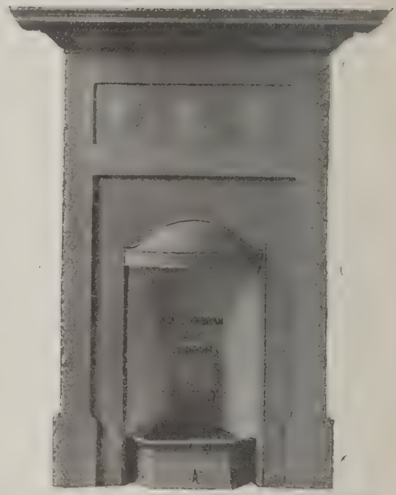

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THE

BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

May 3, 1905. Vol. 21, No. 534. 6, Great New Street, Fetter Lane, E.C.

Summary.

Among the best church work shown in the architectural room at the Academy this year is that of Mr. Ashbee, Mr. Bodley, Mr. Horsley, Prof. Beresford Pite and Messrs. Nicholson & Corlette, while the chief public buildings represented include Sir Aston Webb's fine design for the triumphal archway and buildings at the east end of the Mall, Sir William Emerson's huge Queen Victoria Memorial Hall for Calcutta, a scheme for new buildings at Liverpool University by Mr. Charles H. Reilly, the council-chambers of Cardiff and Deptford town halls by Messrs. Lanchester & Rickards, and a bold design for the grand staircase at Walsall municipal buildings by Mr. J. S. Gibson. The libraries include Mr. H. Percy Adams's notable design for the new central library at Bristol, and among the schools is Mr. Leonard Stokes's Grammar School at Lincoln. The domestic work shown is very good, Mr. Stokes, Mr. Dawber, Mr. Bodley, Mr. Reginald Blomfield and Sir Aston Webb being well represented. (Page 238.)

A joint committee representing the Glasgow Archæological Society, the Glasgow Institute of Architects and the Glasgow Art Club have had drawings prepared to show how the cathedral will be dwarfed by the proposed reconstruction of the Glasgow Royal Infirmary. (Page 251.)

Nothing in the way of restoration, as the word is commonly understood, is to be attempted at the Parthenon or any other of the ancient temples of Greece. (Page 252.)

In his presidential address to the Edinburgh Architectural Association last week Mr. H. O. Tarbolton suggested that a competition committee drawn from members of the Institute and its allied societies should be appointed to make awards. (Page 242.)

The report on brickwork tests by the Science Standing Committee of the Institute is in type and will be published shortly. (Page 253.)

The Bill for the enrolment of qualified architects is to be submitted for the adoption of the Institute at an early general meeting. (Page 252.)

The competition for the Palace of Peace at the Hague is to be thrown open to all architects. (Page 252.)

Are Lightning Conductors Dangerous? FOUR years ago the Lightning Research Committee was organized by the councils of the Institute and the Surveyors' Institution with the object of obtaining trustworthy information on the subject of disasters to buildings by lightning. Some hundreds of cases have been carefully recorded, and the committee is now about to issue its report, to which Sir Oliver Lodge will contribute a preface. The subject, by the very nature of it, is of course one of extreme complexity, and the only possible means of forming an opinion on special cases is to carefully examine the course which the lightning has followed and the condition in which it has left all conductors in its path. Perhaps the most difficult aspect of the matter is that affecting side-flash, and in regard to this especially the report of the committee is awaited with much interest. Our contemporary the "Electrical Review," we notice, raises the interesting question as to whether lightning conductors are a source of danger. A building "protected" by a lightning conductor, says our contemporary, is probably more often struck by lightning than it would be without it; and unless the conductor offers a sufficiently clear run direct to earth, there is the danger of side-flash, when a portion of the discharge will pass through the masonry or metal-work of the building to earth. "Experience appears to teach that the safest way to protect a building from lightning is to keep the conductor quite clear of the building, that is to say, sufficiently far from it absolutely to prevent side-flash. If this be so, the best way to treat an isolated building, such, for example, as a country house, would be to erect a conductor in the form of a tall steel mast, or a wood mast fitted with an efficiently earthed copper conductor, at a safe distance." There can be no doubt that side-flash is the great danger to protect against, because the damage done, say, by the stroke passing from a conductor on the outside of a building through the wall to a safe inside is likely to be most disastrous—far more so than the knocking off of a few chimney pots. The suggestion, therefore, to erect a high mast absolutely clear of the building seems to be a good one, as in that event there could not possibly be any side-flash.

Lord Grimthorpe and the Architects. THE late Lord Grimthorpe had a way of getting at architects which did not leave him a friendly memory among them—quite apart from the obliteration of St. Albans Cathedral, which was carried out at his expense and under his direction. The fact is, he was too much for most of them. He hit hard, and being a layman in matters architectural, this was all the more resented. As the "Times" observes, he would not be led away by the mediæval enthusiasm of Mr. Pugin or the fine language of Mr. Ruskin, though he recognized the merits of both, and owned as to the latter, when much less honoured than he now is, that "Mr. Ruskin might, if he liked, write the best and most popular work on architecture in the world." His guiding text was ever that architecture was the art of erecting new buildings for use and beauty—an admirable text, no doubt, if it were possible to define "use and beauty" in a manner acceptable to all: but that definition was and is an impossible one—hence there arose a mutual antipathy between Lord Grimthorpe and "the purists who preferred a deserted ruin to a church made serviceable for centuries by judicious repair." The purists count a lot of fools among them, but even they are to be preferred to those clean-sweepers who think that old architecture is not presentable till it is tidied up. However, apart from agreement with the views expressed in them, Lord Grimthorpe's books on architecture form interesting reading. Nowadays we have not the same prejudices as the Gothicists of fifty years ago, when "Grounds of Dissatisfaction with Modern Gothic Architecture" appeared, and we can read unconcernedly criticisms which stung the mid-Victorian architects to the quick, but "A Book on Building, Civil and Ecclesiastical, including Church Restoration, &c.," preserves its sting, though we may laugh at the author's egotism. He was, of course, an acknowledged authority on clocks and bells as well as somewhat of an expert in mechanics, and he leaves a great design in Big Ben, which fully carries out his tenet that "a public clock should not vary more than five seconds in any week," Big Ben, as a matter of fact, varying little more than a second during that time. For that at least we are indebted to Lord Grimthorpe.

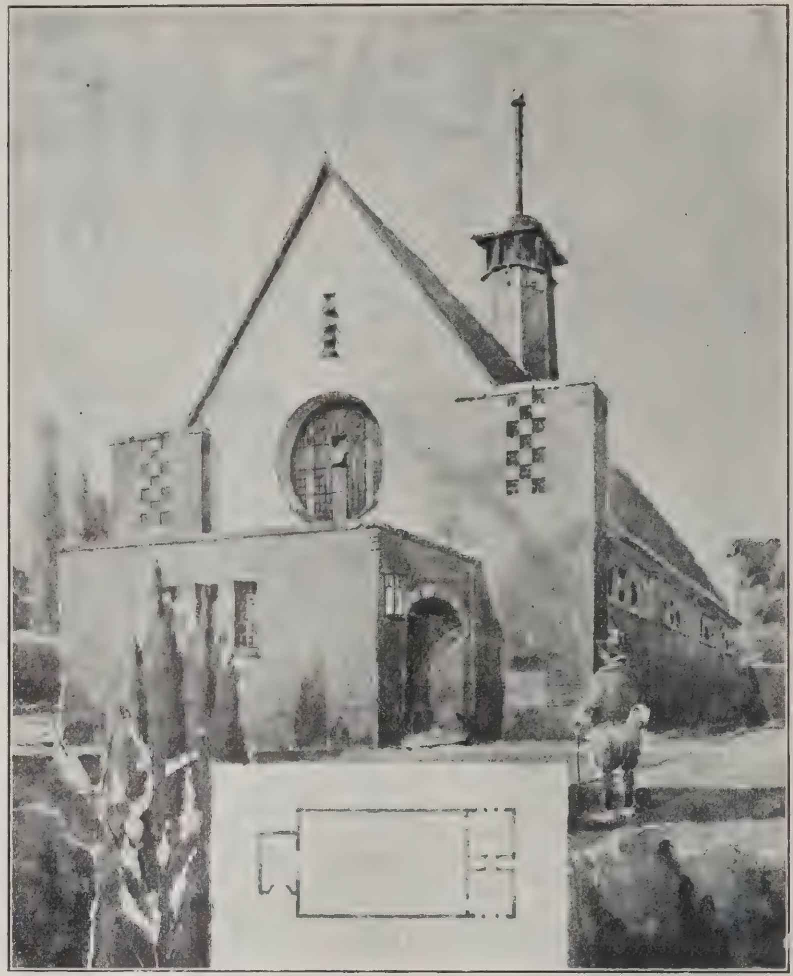
ARCHITECTURE AT THE ACADEMY.

IN connection with every exhibition of the Royal Academy it is usual to say that there is nothing of special interest to be seen, that the collection is extensive but not distinguished for merit, and that one is astonished how some of the pictures could have been hung. For such comment there is an extenuating circumstance—that of boredom; because it is a veritable task to wander through room after room straining and searching, with intervals of collapse, and by the time the critic has come at last to the end of the business he is thoroughly tired out. That is an affair of fifteen or sixteen rooms. To take only one of them—containing about 200 architectural drawings—is an easy matter in comparison: yet, after a careful study of even this small handful, it requires an effort to collect one's disjointed thoughts and form some comprehensive idea of the exhibits.

It will be generally admitted that about a dozen architects—such as Mr. Leonard Stokes, Sir Aston Webb, Mr. Ernest Newton, Prof. Beresford Pite, Mr. Bodley, Mr. H. Percy Adams, Mr. Dawber, Mr. J. S. Gibson, Mr. Horsley and Messrs. Nicholson & Corlette—exhibit work of very high quality, while of the rest it may be said that, in general, it is good, especially the church and domestic work. We may take first the

Church Work.

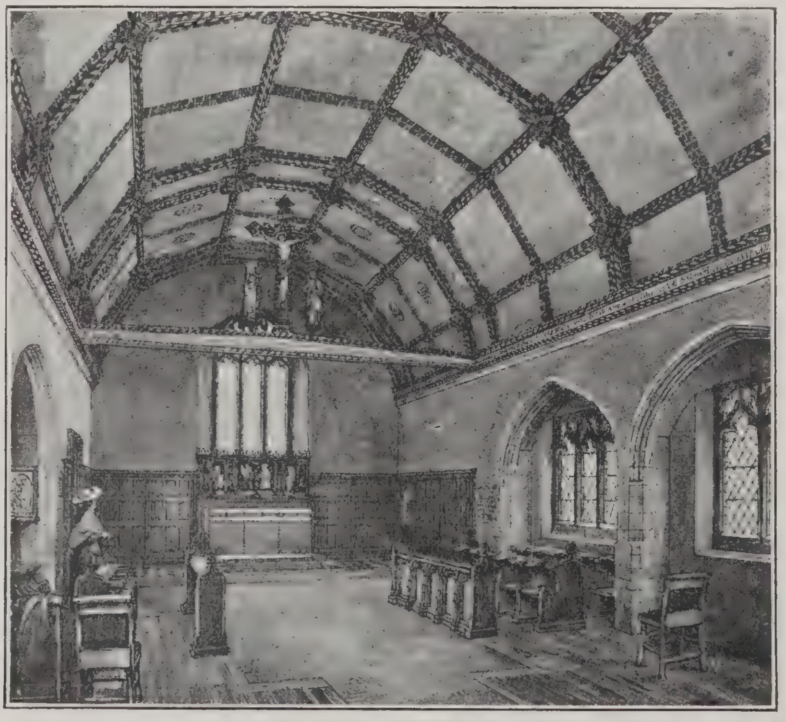
Mr. Ashbee shows a fine design for a church at Wolverhampton, excellent in proportion and detail. It is a strange-looking building, with the nave and tower separated by a covered passage and an arch over, carrying another passageway from half-way up the tower into (presumably) a gallery or stairs in the church, though it is difficult to follow the arrangement without a plan.



(Royal Academy Exhibition, 1905.)

MEETING-HOUSE OF THE BAPTIST CHURCH, CHORLEY WOOD. H. G. IBBERSON, F.R.I.B.A., ARCHITECT.

This building, which will, when the whole scheme is complete, become a schoolroom, is being erected in a rapidly growing district at present without any place of worship. The building committee readily agreed to allow the chapel to be very simple in character, and desired to make no attempt with the thousand pounds at their disposal to imitate the glories of a parish church. The walls are of yellow stocks with rough-cast in the gables, and the roof is of grey-green slates. Mr. A. J. Bates, of Chorley Wood, is carrying out the work under the superintendence of Mr. H. G. Ibberson, F.R.I.B.A., of 28, Martin's Lane, E.C., Cambridge and Hunstanton.



(Royal Academy Exhibition, 1905.)

CHAPEL OF THE ASCENSION, HEATHFIELD, ASCOT. C. H. M. MILEHAM, ARCHITECT.

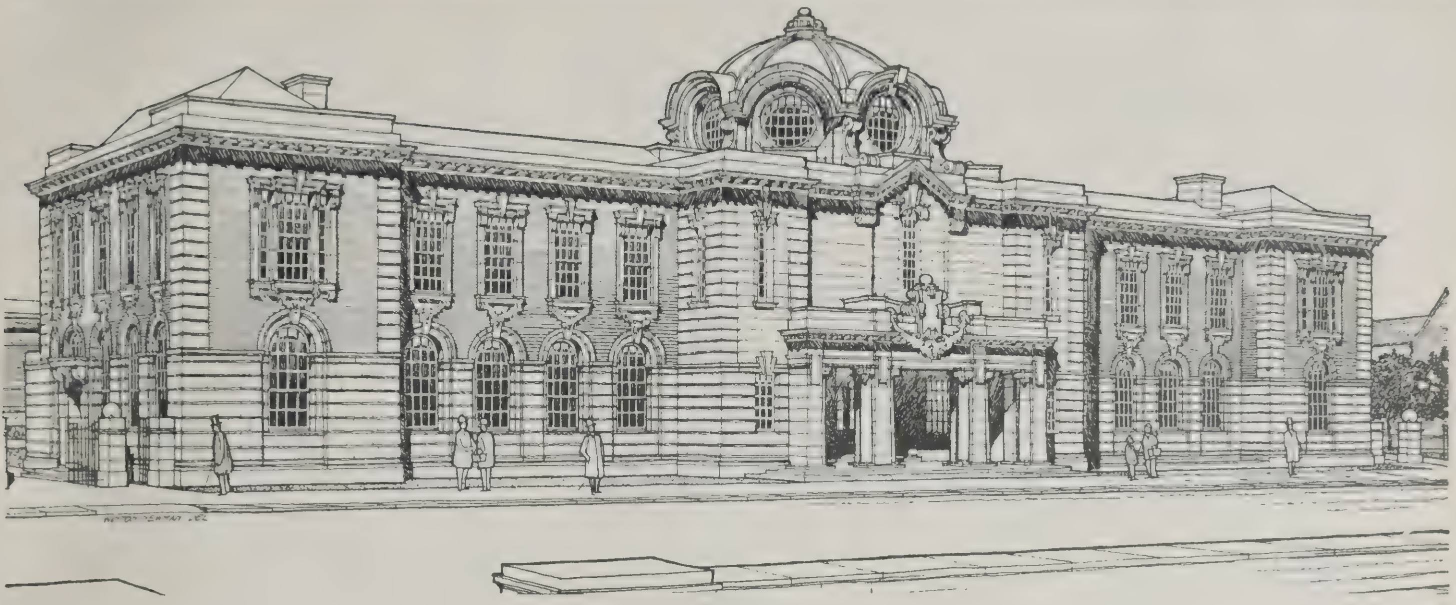
This is the chapel of a well-appointed ladies' school, and was erected in 1903-04 by Messrs. Spear & King, contractors, of Crowthorne. It consists of a nave and sanctuary under a single roof, with an organ gallery and timber bell-turret at the west end, and a small sacristy. The walls are of brickwork, rough-cast outside and stuccoed inside. The roof is of timber covered with plain tiling, and forms a wagon-headed ceiling which is plastered. The chapel is approached from the school buildings by a long enclosed cloister or corridor, of timber and plaster, with a tiled roof. It is expected that the interior will shortly be completed by the decorations and fittings shown in the drawing.

Mr. Bodley has two church drawings, both good examples of draughtsmanship, the one of the interior of a chapel at St. Chad's Church, Burton-on-Trent (signed Charles Gascoyne), being especially well done. The design of this chapel is thoroughly refined in every detail, as also Mr. Bodley's other drawing of the reredos at St. Edward's Church, Holbeck, Leeds.

Some well-executed elevations and sections are shown by Prof. Beresford Pite of Christ Church, Brixton. It is interesting to study these, as the architect has introduced many fresh features, and the detail is everywhere vigorous; but the executed building is not so successful as these drawings of it, the front with its tower being rather a muddle both in treatment and materials. Prof. Pite also shows drawings of his scheme of decoration for the new chancel of Clapham Parish Church.

Of work which is not justly represented by the drawings is Mr. Gerald C. Horsley's delightful church at Longsdon (the drawing of which, by the architect himself, is in the stodgy lifeless style of twenty years ago) and Mr. Mileham's quiet little chapel at Heathfield, reproduced on this page. Messrs. Nicholson & Corlette's additions to All Souls' Church, Hampstead, call for special mention as excellent work. Mr. Flockhart shows a clever design for new Presbyterian church, hall and classrooms at Marylebone, Mr. Edgar Wood an interesting scrap of a drawing of a chapel at Birch, and Mr. W. J. Tapper a very interesting design for the interior of St. Erkenwald's Church, Southend, where a beautiful grille divides off the choir. Of Liverpool Cathedral we still have a relic, in the shape of Mr. Nicholson's design for his exterior (reproduced in our issue for Ocober 19th, 1904).

Mr. Geoffry Lucas is well represented by a plain little country church at Grantham, Mr. Ibberson by the design here reproduced,



(Royal Academy Exhibition, 1905.)

SECOND PREMIATED DESIGN FOR BROMLEY MUNICIPAL BUILDINGS. H. V. ASHLEY AND WINTON NEWMAN, ARCHITECTS.

Mr. Arthur Grove by the new chancel, chapel and vestries just completed at St. John's, Richmond (shown on p. 240 of this issue), Mr. Charles J. Blomfield by a good line drawing of a rood screen for Swaffham Church, Mr. F. K. Oliphant by a rather poor drawing of the rood and screen at St. Mary's Church, Houghton, Mr. Fellowes Prynne by St. Martin's Church, Worcester (which, if carried out in the bluish stone indicated on the drawing, would present a most unfortunate effect), Mr. Temple Moore by a hurried pencil drawing of St. Wilfrid's, Harrogate (a piled-up design which is the worst we have seen by this architect, whose work is usually so good), Mr. Sidney K. Greenslade by a very pleasing design for an altar cross, and Mr. H. H. Statham by a clever pencil sketch of a cathedral conception with a glimpse of the organ.

Messrs. Douglas & Minshull show a coloured drawing of the memorial baptistery at Buckley Church—in which stencil is used extensively, though somewhat harshly; and Mr. Edmund Sedding shows a large drawing of the new church of St. Mary Highweek, Newton Abbot, with a huge tower, correct but rather dull.

A beautiful design in colour for a painted rood screen is exhibited by Mr. J. Harold Gibbons, a pleasing design for Wesleyan church buildings at Bolton by Messrs. Bradshaw & Gass, a wretched design for a domed church by Mr. Lionel W. Grace which somehow managed to win the Academy travelling studentship, a cast-iron drawing of a richly-embellished but not over-interesting church at Elvedon by Mr. Caröe, and a little Catholic church at Egremont by Mr. F. A. Walters which is pleasant in appearance, though not equal to the architect's usual work.

The chapel now being erected at the King's Sanatorium is shown by Mr. H. Percy Adams. The drawings were reproduced in our issue for December 7th last. This chapel is quite unique and at once proclaims itself as the work of a very able architect.

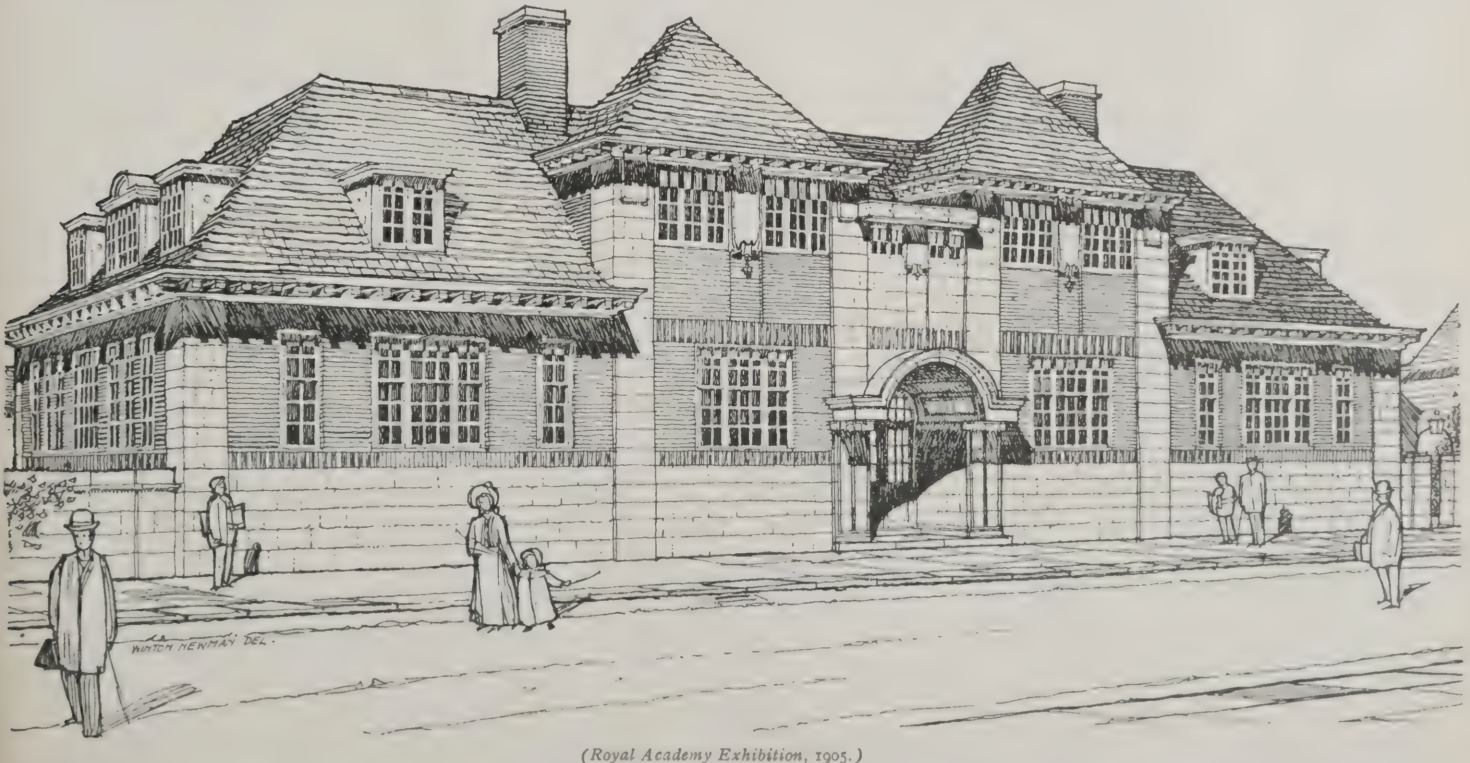
Mr. H. Dare Bryan shows the Western Theological College, Bristol — a careful though not by any means a brilliant design. The rest of the church work embraces some ordinary examples of Gothic design and odds-and-ends of varying interest.

Turning next to the

Domestic Work,

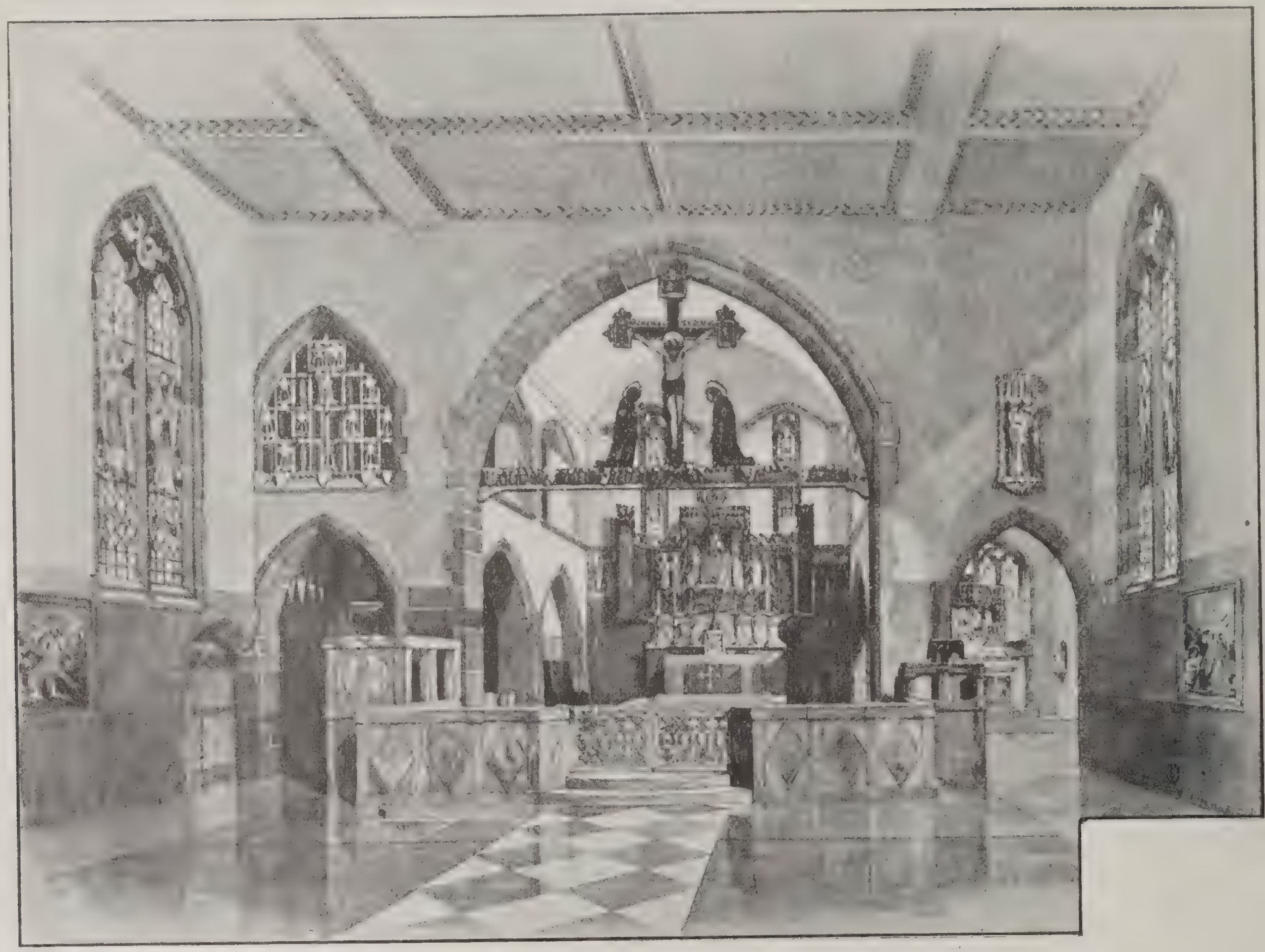
one is confronted with a far greater collection, in attempting to deal with which it becomes necessary to pick out only what is most interesting.

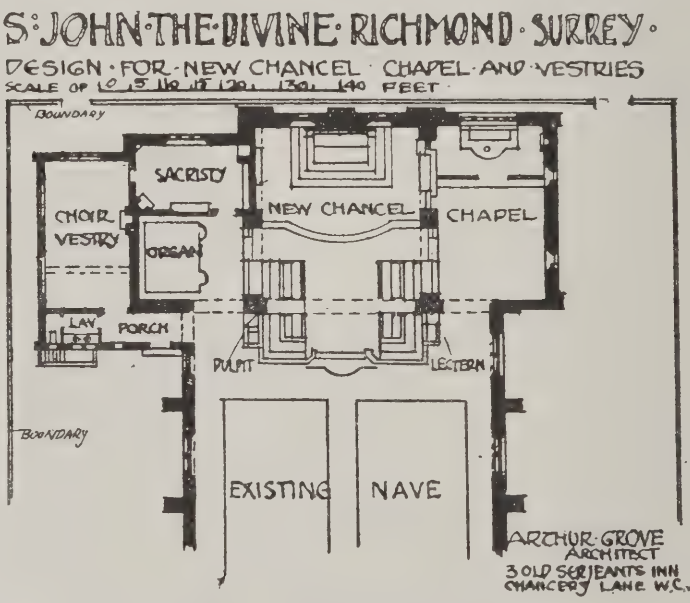
Attention may first be directed to the work of Mr. Leonard Stokes, who shows a most delightful drawing of the hall at Minterne, Dorset, with semi-circular plaster ceiling and dark woodwork—admirable in proportion and detail. Next we may mention Mr. Ernest Newton's three drawings, respectively of a house at Triscombe in Somerset, a proposed house at Reigate, and the front of a house at Bickley (the garden front of which was shown at last year's Academy). At this time of day there is no need to make extended comment on Mr. Newton's work: it preserves the same qualities as hitherto, is always fresh and delightful, and may be counted among


WINTON NEWMAN DEL.

(Royal Academy Exhibition, 1905.)

DESIGN FOR WHITEHAVEN FREE LIBRARY. H. V. ASHLEY AND WINTON NEWMAN, ARCHITECTS.

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ARTHUR·GROVE ARCHITECT
3 OLD SERJEANTS INN CHANCERY LANE W.C.

(*Royal Academy Exhibition*, 1905.)

the very best domestic work done in England to-day. Mr. Dawber is another notable architect of country houses and, as usual, he is well represented at the Academy this year. He shows three drawings: one of a house at Denbigh, another of Solom's Court, Surrey, and the third of the "Dog and Doublet Inn" and new cottages at Sandon, Staffs—the last forming part of a scheme of remodelling and rebuilding which is now being carried out.

Mr. Walter H. Brierley shows the drawing of a house at Scarborough reproduced as a centre plate in this issue, and Messrs. Ernest George & Yeates are represented by two drawings, one of the new loggia and central bay at Welbeck Abbey and the other of the new carriage porch and central tower at West Dean, Sussex—both academic in treatment.

Mr. Bodley shows two fine coloured drawings of alterations to the dining- and drawing-rooms of Powis Castle, though there is nothing to indicate which is old and which is new work. The general effect of these rooms is very rich and baronial, but, personally, we do not care for the Elizabethan style in which the design is executed.

Mr. Reginald Blomfield exhibits a line drawing of a big square house at Rye, in Sussex (which would doubtless look far better in reality than as the drawing represents it), and a large block of new buildings at Lady Margaret Hall, Oxford, carried out in red brick: both these designs being in English Renaissance style, skilfully treated.

Sir Aston Webb exhibits a drawing of the remodelling of the Manor House, Stoke d'Abernon, and another of the headmaster's house at the new naval college at Dartmouth. Each is excellent, the former especially. These drawings go to indicate that the architect excels more in domestic work than in monumental design, though his scheme for the proposed triumphal archway and buildings at the east end of the Mall will be admitted to be noble in effect.

Mr. Caröe shows a very large house near Dublin, well treated, and planned on a liberal scale; Mr. Schultz, Pickenham Hall, Swaffham, in Georgian style; Mr. E. J. May a house near Haslemere, essentially English in feeling; Mr. Gerald Horsley the entrance front to "Framewood," Stoke Poges—quiet and dignified; Mr. Halsey Ricardo a rather remarkable house in Addison Road, Kensington, where bricks of various colours are introduced—grey for the base, green above between the pilasters, and blue in the chimneys; Mr. Prentice a house at Newmarket, the drawing of which is a brilliant specimen of pen-and-ink work; Mr. Flockhart a somewhat theatrical piece of architecture in a house at Henley-on-Thames; Mr. Mountford some rather ordinary flats in course of erection at Sloane Square; Mr. P. Morley Horder a house at Warwick and a cottage at Bledlow (both of which have been reproduced in our columns); Mr. Geoffry Lucas workmen's cottages at Letchworth (reproduced in our issue for March 1st last); Mr. E. P. Warren elevations of the large block of flats called Hanover House, St. John's Wood (reproduced in our issue for September 28th, 1904); Professor Pite some large elevations of a house in Mortimer Street, well worth studying; Messrs. Hart & Waterhouse a house at Enfield and another at Tullylagar—both good examples of English domestic work; Mr. Leonard Wyburd two alarming designs for the dining-room and hall of a country house—after the manner of Mr. Baillie Scott *in extremo;* Mr. Norman Evill a well-designed house at Tidenham, in Gloucestershire; an Arab hall at Assuan by Mr. Henri Favarger; Mr. George L. Alexander a well-designed stable at Wonersh; Messrs. Silcock & Reay a new entrance to Bailbrook House, Bath, which looks far better as executed; and Messrs. Forsyth & Maule delightful additions to "The Stocks," Wittersham, Kent; while several well-designed new fronts to houses in the west of London are shown by Mr. W. Henry White, Mr. Ambrose Poynter, Mr. Edwin W. Felkins and Messrs. Niven & Wigglesworth.

Public Buildings.

In this country we do not excel in monumental design—possibly owing to our method of architectural training—but we have some most inspired examples in the English Renaissance to which we can turn with admiration, and it is generally admitted that a development on those lines is the best we can adopt.

In the Academy this year there are drawings of half a dozen very large and important public buildings. First in merit, though not in size, is Sir Aston Webb's design for the archway and buildings at the east end of the Mall leading into Charing Cross. Much curiosity has been evinced in regard to what was proposed for this termination of the great new processional road from Buckingham Palace, in connection with the National Memorial to Queen Victoria. Now that the design is before us, we think it will meet with general approval. It is really a fine design, big in feeling, well proportioned and dignified. On plan it is segmental, with the three archways in the centre and buildings on either side, the façade to Charing Cross having columns and sculpture and the whole surmounted by a quadriga. The chief weakness of the design is in the detail of the capitals, which are insignificant.

The memorial to Queen Victoria in Calcutta has taken quite a different form, being a huge hall in marble with a great dome in the centre. Sir William Emerson shows a large coloured drawing and a model of the building, which will be known to our readers by the photograph which we published in our issue for February 22nd. There is undoubtedly a good feeling about the general mass, but we do not consider the design to be really notable. Like Milan Cathedral, it commands attention by its very size, but the conception is not great.

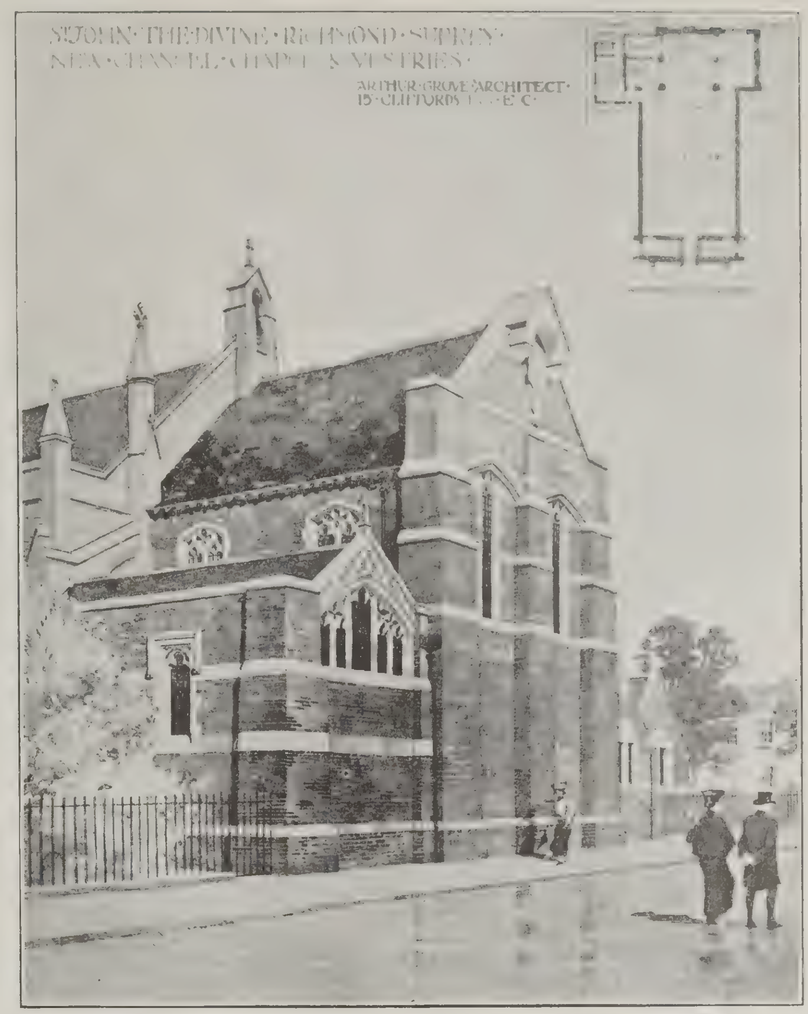
Mr. Charles H. Reilly, who is now professor of architecture at Liverpool University, shows a very fine scheme for new buildings for the faculties of arts and fine arts at the university. This is exceptionally well thought out and treated.

Several important

Municipal Buildings

are included. There are the town halls at Cardiff and Deptford, the council-chambers in both of which are shown by Messrs. Lanchester & Rickards; the huge block of the new town hall and law courts at Hull, by Messrs. Russell & Cooper—a fine design bold in treatment; the grand staircase at Walsall municipal buildings by Mr. James S. Gibson—a splendid piece of design rendered by a very clever pencil drawing; the proposed extension to Chelsea Town Hall, a scholarly treatment, by Mr. Leonard Stokes; municipal buildings at Ilkley by Mr. W. Bakewell (reproduced in our issue for December 28th last), and similar buildings at South Shields by Mr. E. E. Fetch, this latter including a high tower not well proportioned.

Messrs. Woodhouse, Willoughby & Langham show the new fire and police station at Manchester (illustrated in our issue for June 10th, 1903)—which masses well together.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Libraries and Schools.

Under this head we may first refer to Mr. H. Percy Adams's two drawings of the new central library at Bristol. This is a notable building, thoroughly fresh in treatment and worthy to be included amongst the architect's best work.

Mr. Hare shows a corner of the public library at Harrogate, Mr. T. Gibbon a clever drawing of one of the Glasgow public libraries, and Mr. Maurice B. Adams two new libraries at Bromley and Eltham—about all of which there is no special comment to make.

Among the schools shown is a fine design for the grammar School at Lincoln, by Mr. Leonard Stokes; a pleasing design for a new choir school-house at New College, Oxford, by Messrs. Nicholson & Corlette; and a characteristic design by Mr. C. F. A. Voysey for the Lincoln Grammar School; while Mr. Arnold Mitchell exhibits an outline drawing of the new University College School, Hampstead; Prof. F. M. Simpson his design for the same building, submitted in competition; Mr. John Bilson an excellent design for an extension to the boarding-house at Grantham Grammar School; Mr. Walter Cave his competition design for memorial buildings at Eton College; and Mr. Paul Waterhouse a hard drawing of the new medical school and nurses' home for University College Hospital.

Business Premises.

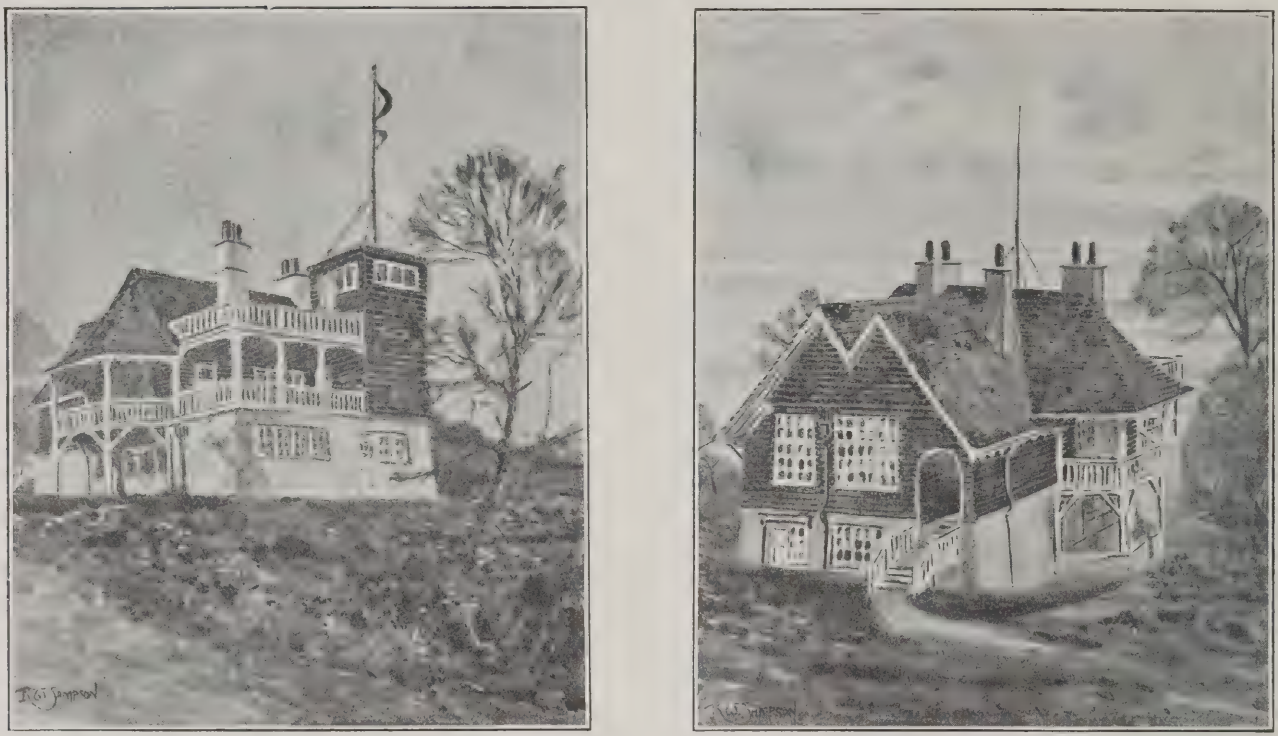
There are several noteworthy designs for business premises exhibited. Mr. Edwin J. Stubbs shows an exterior and interior of the new exhibition hall and offices for the Royal Horticultural Society (reproduced in our issue for December 28th last)—a fine design with a good exposed iron roof over the hall; Messrs. Matear & Simon the Liverpool Cotton Exchange and Messrs. Bradshaw & Gass the Manchester Stock Exchange—also reproduced in our issue for December 28th, and both worthy of the closest attention; Messrs. Niven & Wigglesworth an excellent design for the "Dundee Courier's" new premises; Mr. T. Middleton Shallcross an excellent design for proposed shops in a provincial town; Messrs. Skipper new assurance offices at Norwich, on safe classical lines; Messrs. Silcock & Reay a fine design for the Crown Brewery at Bath; Mr. Arthur Blomfield a bank at Chelmsford; and Mr. Henry Tanner, jr., the new shipping offices in Cockspur Street, London—a building of varying merit.

Of other designs not classed under the foregoing headings we may mention Mr. Frank T. Verity's new Scala Theatre in Fitzroy Square, London, Mr. J. B. Fulton's design for a picture and sculpture gallery, and Mr. Marshall Mackenzie's drawing of the arcade in the new art gallery at Dundee.

THE USHER HALL, EDINBURGH.

Report by Sir Aston Webb.

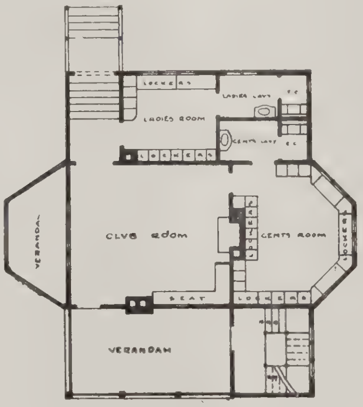
It will be recalled that the Edinburgh Town Council remitted to Sir Aston Webb the question of the acoustics and general arrangement of the Usher Hall, as planned by the city architect, Mr. Morham. In his report Sir Aston Webb says that he considers the removal of the dome and the formation of a straight ceiling essential. Further, he thinks that the lunette windows in the circular cove of the ceiling should be removed and placed below the main cornice. His general idea is that the hall is inclined to be too long for its width. He suggests that it should be made wider, so as to get a more harmonic proportion between length, width and height. He agrees that the whole of the orchestra end should be lined with wood in order that it may act as a sounding board.



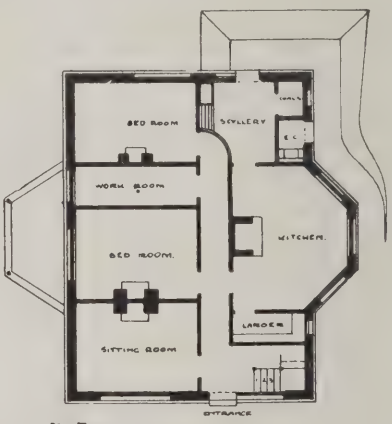
(Royal Academy Exhibition, 1905.)

GOLF CLUB PAVILION, SIDMOUTH. R. W. SAMPSON, ARCHITECT.

This building is rather more than a pavilion and rather less than a club house, the links being so close to the town that the latter was unnecessary, though at the same time it was considered desirable to make the pavilion as comfortable as possible, so that the accommodation includes caretaker's rooms below (occupied by the ground man) and club rooms above, with wide verandahs for afternoon tea and for viewing the play. The lower part of the building is built of brick, finished with rough-cast, and the upper portion is of timber framing plastered inside and weather-boarded outside, the latter being treated with Carbolinium, and the wrought woodwork painted white; the roof is covered with local tiles. The building has been erected at the expense of Major J. E. H. Balfour, D.S.O., of the Manor, Sidmouth, the contractors being Messrs. R. W. & J. Skinner, of Sidmouth.



Ground-floor Plan.



Basement Plan.

EDINBURGH ARCHITECTURAL ASSOCIATION.

President's Valedictory Address.

AT the annual general meeting of the Edinburgh Architectural Association held last week Mr. Harold O. Tarbolton, F.R.I.B.A., president, delivered his valedictory address. Speaking of the position of municipal bodies with regard to public works, he said that as that kind of work involved grave interests of an artistic, practical and financial nature, it was essential that the services of only properly trained and experienced architects should be retained. Architectural work should not be placed in the hands of engineers and surveyors, and the work of the official architect should be restricted to structures of secondary importance, all buildings of a monumental character being entrusted to independent architects, selected in such a way as might seem best to the local authority concerned.

With regard to

Assessors in Public Competitions

Mr. Tarbolton said that the difficulty lay in the haziness which surrounded the position of an assessor. His duties were certainly ascribed, but there was no recognized rule as to the terms of his employment. He had no stated fees, and the large accounts which were frequently sent in by assessors had naturally frightened many who would willingly seek their assistance. Some clear definition of the obligations of assessorship was wanted. He thought the difficulties might be obviated if the Institute were to appoint a Competition Committee drawn from its own body and the various allied societies throughout the country. The duty of such a committee would be to examine competitive designs and to give awards upon the same. This would encourage promoters of competitions to make these bodies their referees. He recommended the appointment of either three or five assessors instead of one, in which case the award would not only be more final, but would remove the tendency to play up to the idiosyncrasies of a single assessor, whose predilections for certain types of architecture might be well known.

Referring to the question of

Monumental Sculpture

he said that in countries where sculpture thrived more happily than in our own, statues were seldom placed in the open. They were placed upon the sides of places of moderate size, and when so disposed as to get value from background, whether of stone or of vegetation, they gained vastly in effect. The statues in Edinburgh were invariably placed in an unfortunate position, as if merely dividing the lines of tramcar or other traffic.

Alluding next to the

Ownership of Architects' Drawings

Mr. Tarbolton said that that was a matter of great importance. He took it that all architects were agreed that, unless a special arrangement had been arrived at, the client paid for a concrete result, and that the drawings prepared were only the customary means employed by architects for illustrating their ideas for the benefit of the workmen. As such, the client had no more right to them than he had to the architect's office materials. He could hardly find anything quite analogous in other professions. The question recurred again and again in the Courts, and it still awaited some final settlement. He did not hesitate to admit the right of a client to the possession of any plans of a pictorial or sketchy nature prepared primarily for the client's benefit, but he did strongly dispute his right to demand the mechanical apparatus set in motion to give certain tangible results.

The Association recently visited Drum House, Gilmerton, which is supposed to have been the work of the elder Adam. It was built about 1724, and is an early example of fully developed Palladian style in Scotland. The grandeur of the front, compared with the meanness of the other elevations, is characteristic of the time. Attention was drawn to the fine stone detail of the front elevation, the leadwork—which was rare in Scotland—and the interior plasterwork by Italians.

THE INTERNATIONAL BUILDING TRADES' EXHIBITION.

THIS week we conclude our notice of the Building Trades' Exhibition at the Royal Agricultural Hall, Islington, which closes on Saturday next, May 6th. It has been generally approved as an excellent show, eminently instructive and useful to all connected with the building trades, and has been visited by a very large number of people. To-day the Society of Architects are paying a visit and on Saturday the Architectural Association. Many well-known firms are not represented, but taken as a whole the exhibition is a comprehensive one, and all who have not yet visited it should make a point of doing so.

LORD WINDSOR in his opening speech said that if any proof were wanted of the undoubted success and usefulness of the Building Trades' Exhibition it could not be better found than in the increasing number of exhibitors. He mentioned that in 1895 there were only ninety-two exhibitors, but that during the last five exhibitions, held biennially, the number had steadily mounted up to 317 this year. He felt certain that the public would recognize the usefulness and importance of such an exhibition. The increase in the number of exhibitors showed that the designers and manufacturers in those industries connected with the building trade found it worth while to place their inventions before the public, and the more complete the exhibition became the more it was worth the while of the visitor that came there and the better was he able to carry away useful hints if he were interested in building. Lord Windsor said he wished to make special reference to smoke abatement. He urged the importance of this question. London was not the only transgressor, for one had only to visit the large commercial industrial towns to find the surrounding vegetation killed; but certainly London was hardly bearable when there was a fog. We saw the trees in the parks dying because of it, and our buildings suffered just as disastrously. How much of the stonework of buildings in London was destroyed by smoke? Fortunately, however, the Portland stone available, with its white lights and grey shadows, seemed suitable and most beautiful for the Metropolis; yet we had to go to our professors in chemistry and ask them how we could preserve it, and although cure was a good thing prevention was better, and he hoped the exhibition would keep before the public all the best means of prevention in regard to this matter. The question of dealing with fireproof buildings was another most important one, and it was satisfactory to know how many of the exhibits dealt with it. We were constantly confronted with new materials and new methods of utilizing them. We saw in London streets skeletons of buildings being reared up on a framework of steel, which might be more or less concealed by brick or stone, and we saw sometimes the distressing fact of what appeared to be a massive stone wall resting apparently upon a plate-glass window. It was steel, no doubt, which did this, and he ventured to think we were hardly right in using our inventive powers to conceal a material and make it appear something other than it was, giving almost invariably a sense of insecurity and bad construction; rather we should give a full recognition to these necessary materials, and turn our minds as far as possible to dealing with them in the most natural and therefore in the most artistic manner. In conclusion, he urged the importance of cheap houses to the public, and said it was to those present to whom they had to look for the solution of this knotty problem.

Mr. Fitzroy Doll, F.R.I.B.A., Mayor of Holborn, proposed a vote of thanks to Lord Windsor, which was seconded by Mr. H. Greville Montgomery, who said that for the first time in the history of the Building Trades' Exhibition the Agricultural Hall was full of exhibits. When he became connected with the exhibition he determined to eliminate what were called "side-shows." It had taken a long time to perfect the exhibition, but no one could say there was an exhibit this year which did not in some way or other appertain to the building industries.

Asbestic Bricks.

Stand No. 61, Row C.

At Lodge Place, St. John's Wood, N.W., on land adjoining the Regent's Park Canal, plant has been erected by the Asbestic Brick and Tile Co. for the manufacture of asbestic bricks according to a French process, and specimens of the bricks are to be seen at this stand. The works have only recently been completed. The process is briefly as follows:—The materials, sand, asbestos and lime are elevated to the first floor, mixed in a steam-jacketed machine, conveyed firstly to hoppers where the lime slakes, and then to the brick-making machine house, where the materials fall into edge-runner pans to receive the final grinding, mixing and incorporating before being pressed into brick form. From the presses (one of which we illustrate on this page) the bricks are stacked in blades on platform wagons and hardened in autoclaves or large steam boilers, of which there are three, each 38ft. long and 6ft. 6ins. in diameter. These lime-sand bricks are free from the usual defects of shortness in the grain by reason of the incorporation of asbestos fibre, and their high resistance to fire was testified by a recent official test, while their exactness of form and evenness of tint are superior to ordinary clay bricks. Many shades of colour are produced, and are noticeable for their softness of tone. Tests prove the strength and low porosity of these bricks.

Terra-cotta Partitions.

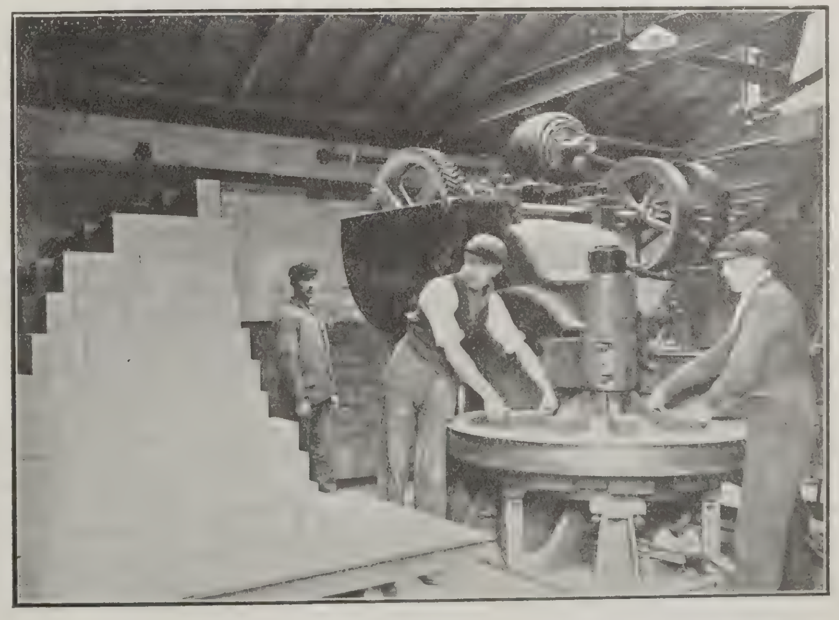
Bay No. 14.

The London and Brighton Brick, Tile and Terra-cotta Co., Ltd., of Crowhurst, show some admirable terra-cotta partition blocks, tubes for fire-resisting floors, and bricks. The Williams partition blocks have numerous holes into which the cement mortar penetrates, forming dowels, and so binding the partition together that most of the weight is transmitted to the walls and little comes upon the floor. Grooves on the face give an excellent key for plaster. These blocks are light, and are very suitable for half timber houses, greatly lessening the cost, as they only require rough casting on the face and plastering inside. Several sections of various sizes are made for fire-resisting floors. They are easily adaptable for application to wood joists and are most useful for adapting existing floors. The facing bricks, 2ins. thick, are rich and even in colour, and of good shape, and made with sand or smooth terra-cotta face. Wire-cut backing bricks are made to bond with the facing bricks at ordinary common brick prices, and obviate the troublesome justification and bonding entailed in the use of ordinary-sized bricks for this purpose.

Reinforced Concrete Tubes.

Stands Nos. 14 and 15, Rows B and C, Gallery.

Messrs. John Ellis & Sons, Ltd., of Leicester, exhibit a variety of large tubes constructed in reinforced silicated concrete. The materials used in the concrete are Mount Sorrel granite crushed to pass through a $\frac{1}{4}$in. mesh and Portland cement in the proportion of 3 to 1. The steel ribs are $\frac{1}{4}$in. round steel wire rings, placed 9ins. apart. Manholes made of the same materials are also shown at this stand, as well as patent granite concrete invert and sewer blocks, made applicable to any shaped sewer, paving slabs, kerbs, &c.



MOULDING PRESS FOR ASBESTIC BRICKS.

Glazed Bricks.

Stand No. 19, Row D.

The exhibit of Messrs. Ingham's Firebrick Co., of Raven's Lodge Brick and Pipe Works, Dewsbury, deserves notice by every architect and builder. Special attention may be called to their glazed bricks. The manufacture of reliable glazed bricks is very difficult. So many points have to be taken into account, and so much care has to be exercised over every part of the process, that it is not surprising few bricks are put on the market that are uniformly of first quality. In our opinion no brick that is not made complete in one operation will be satisfactory. To biscuit the clay first, and then fire again for the glaze, prevents that adhesion of the two which is absolutely essential for the glaze to stand. Messrs. Ingham's Firebrick Co., although they have only recently taken up the manufacture of glazed bricks, have succeeded in overcoming the difficulties of producing a brick in one firing. Those who are unfamiliar with the science of brickmaking can have little appreciation of the difficulties to be met. One of the chief of these is the even regulation of the temperature in the kiln. Then, again, there is the necessity of preventing ashes entering the kiln, as they would speck the glaze. Further, there is the question of the composition of the glaze as to resistance, temperature and colour, and also the working and moulding of the brick into shape, and the retaining of that shape under fire, and the keeping of the size exact. The bricks of this firm are all made with leadless glazes—a requirement which is rightly being increasingly insisted upon by architects. Another special point about these bricks is that they taper very slightly from the face to the back. This seemingly small matter is nevertheless important, as it allows the perpends of a wall to be kept correct during erection without the necessity of chipping one course of bricks, so as to slope the wall back again to a true line. At this stand is also shown a distributing manhole in glazed ware. It is circular in shape and has two or three outlets for distributing sewage in two or three directions. Grooved slots are placed in front of each outlet for cutting off the supply, and in these wooden or iron standbacks are placed, these being built up according as the sewage is required to be distributed in one direction or another. By placing a 24in. diameter pipe on top of the manhole, with an outlet, the sewage may be distributed at a slightly higher level if desired. The purposes for which this manhole is suitable are numerous, and will occur to those interested. Its advantage as regards setting in loose or made ground is distinct as against an ordinary brick-built manhole, while the saving in cost is considerable.

JOINERY.

Mouldings, Doors, &c.

Stand No. 95, Row E.

Messrs. Samuel Elliott & Sons, Ltd., of Caversham, Reading, have some fine examples of their joinery work on view at this stand. Mr. Samuel Elliott, late of Newbury, has been engaged in the trade for fifty-five years, so that his experience is as comprehensive as could be desired by any architect, while his reputation is a guarantee of good work. A noticeable feature at this stand is a door made for H.M. the King's box at the new Waldorf Theatre now being erected in Aldwych. The examples of mouldings show the perfection of the firm's machinery for turning them out clean and its ability to deal with intricate work, while the timber is of special selection. We might mention that Messrs. Elliott are executing woodwork for the new Westminster Cathedral, Bentley's masterpiece, and have already completed work in the Bishop's Palace and the great doors to the cathedral, which weigh two tons each and are 6ins. thick out of solid timber.

Joinery and Stone.

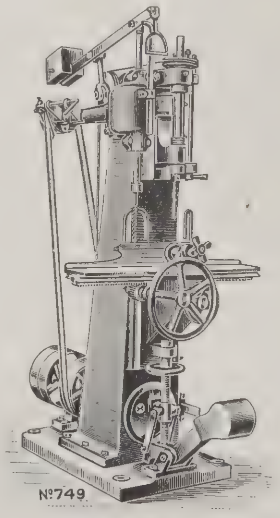
Stand No. 67, Row C.

Messrs. Strange & Sons, of 34, London Road, Tunbridge Wells, are showing examples of work executed at the Holly Bank Joinery Works and of stone from the Tunbridge Wells Stone Quarries. The joinery shops have been designed and erected for a large output and the machinery is of most modern type, while the stock of woods is a large and good one. The work is turned out with the best finish, as may be judged from exhibits at this stand. Contracts have been executed for many architects of eminence. The Tunbridge Wells stone is a warm buff-coloured sandstone of fine texture and grain and beautifully marked. It retains a fine arris, and weathers well. Among the buildings executed in this stone may be mentioned Hever Castle, Tonbridge Science Buildings and Tonbridge School and Chapel.

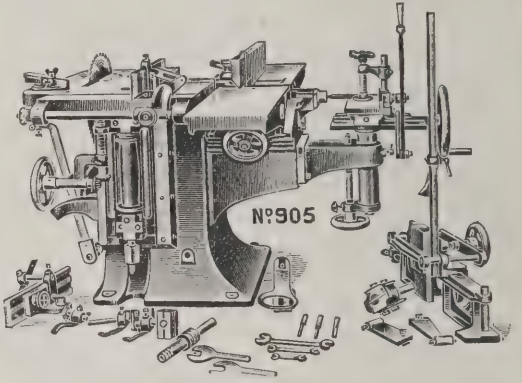
Woodworking Machines.

Wall Space 129.

A number of woodworking machines of interest to contractors and others are exhibited by Messrs. Sagar & Co., of Canal Works, Halifax. These include the following:—(1) An improved circular saw bench; (2) a band sawing machine; (3) the "Premier" hand and roller-feed surface planing, thicknessing, moulding, &c., machine; (4) an improved planing-out-of-twist and jointing machine; (5) a panel planing, thicknessing, tonguing, grooving, moulding, &c., machine; (6) a vertical spindle moulding and shaping machine; (7) an improved tenoning machine; (8) a patent automatic dovetailing machine; (9) a patent tenoning apparatus; (10) a mortising and boring machine; and (11) a general joiner or variety woodworker. We illustrate the last three named. The patent tenoning apparatus is intended for use in connection with vertical spindle moulding machines. It will make a complete accurate tenon. It consists of an oscillating bracket carrying the cramp for holding the timber in a vertical position, and when the piece to be worked is fixed, this cramp is made to slide past the cutter block, and one side of the tenon is made. The bracket is then brought over to the left by a simple movement and the cramp slide pulled forward. The tenon is then completed. Suitable adjustable stops are provided on the table to regulate the thickness of tenon and depth of shoulders, and a very simple arrangement is fitted so that the length between the shoulders of tenons may be accurately gauged so as to avoid the trouble of measuring or marking off, and all pieces are finished exactly alike. The mortising and boring machine is intended for the general run of mortising in joinery, sash and door work, &c. It is easy of operation, runs at a high speed, and will get through a great deal of work in a little time. Where a combination machine is required the general joiner is a happy arrangement. There is no doubt that separate machines for separate operations are much to be preferred, but where for considerations of limited space at disposal, quantity of work to be done, &c., a combined machine is advisable, we can recommend this one with confidence. It will do many kinds of planing and sawing works, sawing up to 6ins. deep, will work any kind of moulding on straight, circular or irregular-shaped pieces, &c., and will tenon and mortise. All these operations are done from three separate spindles by means of suitable saws and cutters, any of which can be easily put on or changed for others.

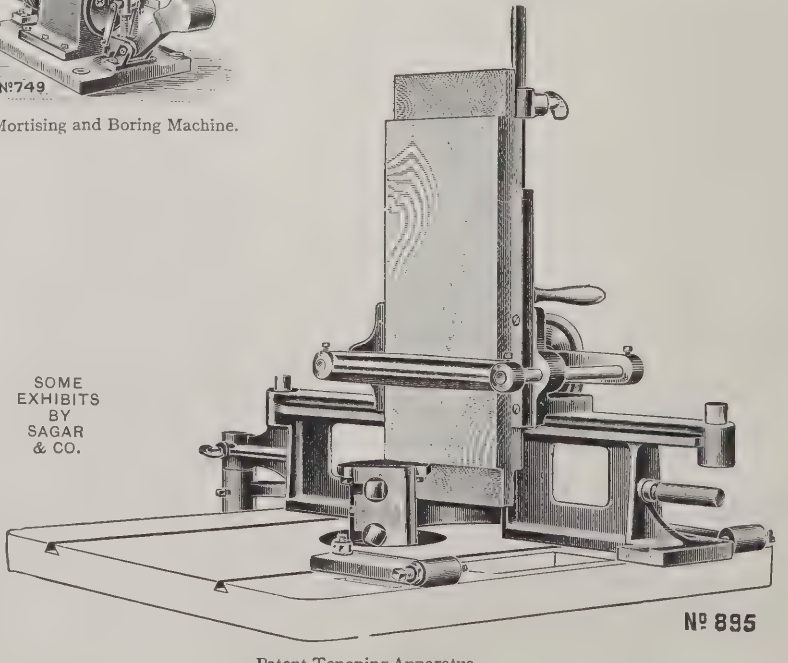


Mortising and Boring Machine.



General Joiner.

SOME
EXHIBITS
BY
SAGAR
& CO.



Patent Tenoning Apparatus.

Woodworking Machinery.

Wall Space No. 135.

A large and interesting collection of woodworking machinery is to be seen at Messrs. F. W. Reynolds & Co.'s stand, all driven by an electric motor of 10-b.h.p. The machines shown are as follows:—Three hand mortising machines, a steam power reciprocating mortising machine, a chain mortiser, a trying-up and jointing machine, a thicknessing machine, a vertical spindle, a band saw, and a machine- and a hand-power combined saw-bench and band saw. The special feature of the exhibit is the chain mortiser, but equally striking is the vertical spindle, which works anything up to 4½ins. in depth to any mould and either straight or circular. The hand-power central lever mortising machine should be carefully studied; it gives extra play at the end of the stroke and will take work up to 11ins. by 7½ins. Messrs. Reynolds's address is Acorn Works, Edward Street, Blackfriars Road, S.E.

Cheap Doors.

Stand No. 99, Row E.

Messrs. Stavers & Stavers, whose address is 158, Leadenhall Street, E.C., are showing a considerable quantity of doors that are remarkably cheap considering their finish and quality. These are Swedish made to the firm's special designs. There are 30 or 40 new designs shown, ranging in price from a five-panel door at 12s. 6d. to one at 18s. 6d.; and other very cheap plain doors. Many of these designs are distinctly happy, and are far superior to the usual class of thing. The cleverness of the Swedes in making the joints hardly visible is particularly noteworthy. A somewhat new departure as regards stock doors is to decorate the panels with embossed designs in relief coverings, which can be painted over and picked out as desired. A patent graining process is shown that is a most remarkable imitation of natural wood, and adds only about 3s. 6d. on to the cost of a door. A number of mouldings of good section, cleanly worked, exceedingly free from knots, and cheap, are also in evidence. While this exhibit appeals more particularly to speculative builders, architects may well take note of it, for in cheap work stock doors are often a necessity, and any means of obtaining a little richness without additional cost is welcome.

Wood-block Flooring.

Stand No. 112, Row F.

This stand of the Acme Flooring and Paving Co. (1904), Ltd., of Gainsborough Road, Victoria Park, N.E., which is floored in 1½in. pitch-pine on Mr. Duffy's patent "Immovable-Acme" system of dowelled wood blocks, is an index to the firm's main exhibit in the gallery (bays 9 and 10), where examples of this paving in various woods are shown, as well as jarrah and karri planks, red gum planks, &c.

"Solignum"—a Wood-preserving Stain.

Stand No. 29, Gallery.

Messrs. Major & Co., Ltd., of Hull, again supply a picturesque addition to the Exhibition, demonstrating the advantages of their wood-preserving stain "Solignum." This year their stand takes the form of a summer-house with a small verandah in front. The woodwork is treated with "Solignum" in brown and green shades. If the wood-preserving properties of "Solignum" are as satisfactory as its appearance—and a glance at the numerous testimonials to be seen at the stand assure us of this—it must be a valuable preparation. "Solignum" is easily applied, it has a large covering capacity, and is moderate in price. It is now being extensively used, and is a cheap and effective covering for fences, gates and wooden outbuildings. It has antiseptic properties, prevents the accumulation of vermin, and it can be advantageously used for both the inside and outside of wooden buildings occupied by animals. "Solignum" is easily applied and can be put on cold, though it is best applied hot. It has a considerable covering power: a gallon will cover 250 to 350 sq. ft., according to the quality and condition of the timber. Wood treated with "Solignum" does not become more inflammable. Four shades are made: three of brown (the lightest shade maturing to a reddish brown, the medium to a Vandyke brown, and the darkest shade to a black brown) and one of green (a very pleasing tint).

A Paint Remover.

Stand No. 27, Row A.

Messrs. H. E. Kershaw, Ltd., of 120-131, Curtain Road, Shoreditch, have a special exhibit giving prominence to their paint-remover "Kompr." This is an article of very great interest to the building trade. It will remove paint in a minute, is entirely free from acids, alkali or any other chemicals, and will not hurt the most delicate fabric, or the flesh. "Kompr" is 9s. a gallon. Messrs. Kershaw also exhibit French polish and spirit varnishes, glue and brushes, and builders' ironmongery.

"Chez-Lui" Enamels and Stains.

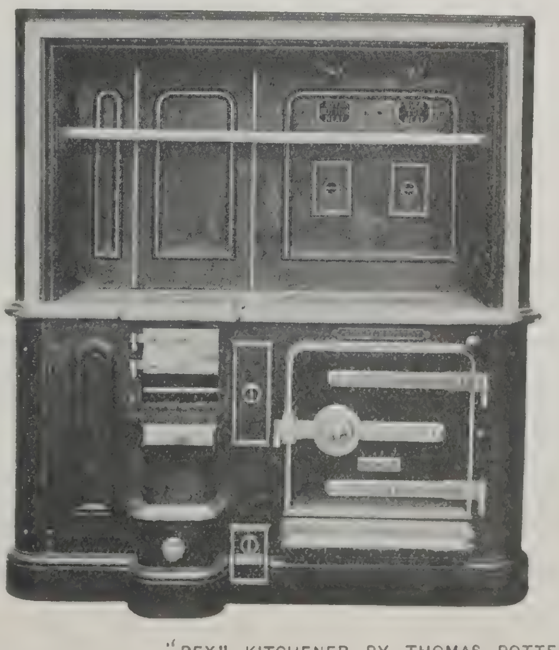
Stand No. 41, Row B.

Messrs. James Price & Son, of 10-20, Fitzroy Place, Euston Road, N.W., exhibit numerous enamels, paints and stains—more particularly the several varieties of enamels and stains for sanitary and decorative work known under the registered name of "Chez-Lui."

Ranges.

Stand No. 44, Row B.

Mr. Thomas Potterton is showing his "Rex" and "Regina" kitcheners and high-pressure bath boilers, the patent "Zig-zag" range boilers, and patent gas-heated hot-water system for domestic services, "Victor" gas boilers, and acetylene gas generator. We illustrate on this page the "Rex" kitchener with single oven, and the single-handed boiler. The special feature about these kitcheners is that they are different to the usual arched flue bath boiler, with the fire passing under it and direct up the chimney, as in the ordinary type of kitchener, which is distinctly uneconomical of fuel if hot water is required. In these ranges the boiler is constructed so that the flue is formed between the boiler and the oven, where it descends and passes under the oven and up at the rear. By this means a very long flue travel is obtained, with little heat wasted, while it enables hot water to be obtained at the same time as the ovens are heated. By the use of dampers, top or bottom heat may be obtained, as desired, for cooking. An arrangement is supplied in which there is a separate flue for the boiler to heat water alone, this being entirely closed while cooking. A very useful little hob register, fitted with a patent high-pressure boiler, is shown at this stand. It would be very advantageous in many buildings, such as flats, as it allows hot water to be obtained for domestic or heating purposes when the kitchener is not in use, or where cookers are arranged instead of coal ranges. This stove has wide hobs, which can be used in cooking. The special "Victor" gas boiler and hot-water circulating apparatus is very useful for domestic services with or without gas-cooking ranges. The boiler is made of copper, and consists of one or more tubes in an outer shell enclosed in a cast-iron frame. They can be fitted to any make of cooker by cutting away part of the side.



"REX" KITCHENER BY THOMAS POTTERTON.

High-class Mosaic.

Stand No. 42, Row B.

The exhibit of the Mosaic Manufacturing Co., 18 and 20, King's Road, St. Pancras, N.W., consists of mosaics of every description in marble, glass and ceramic; parquetry, leaded lights and hammered copper. Original designing combined with good workmanship place this firm in the front rank of modern mosaic workers; and the exhibits at this stand will be appreciated by all who have an interest in first-class work.

A Wonderful Imitation of Marble.

Special Position No. 9.

At this stand of Messrs. Durolite, of 86, Leadenhall Street, E.C., to whose exhibit of opal tiling we referred on p. 223 of our issue for last week, some remarkable examples of imitation marble are shown. These appear to be produced by a photographic process, the image being transferred on to the tile and there fired, the result being wonderfully true to the original—in fact, even on a close inspection it is difficult to detect that this is not real marble.

Stable Fittings.

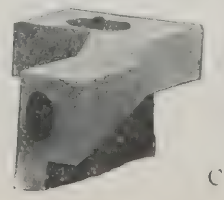
Wall Space No. 134.

In addition to the grates exhibited at this stand by the Carron Co., of Carron, Stirlingshire, and 15, Upper Thames Street, E.C., which we noticed on p. 224 of our issue for last week, stalls for a racehorse and a carriage-horse, and loose-box, are shown, carefully finished in every detail, and special attention is directed to a manger which has a turned-over top that prevents the horse injuring himself whilst feeding, and also prevents him throwing the food over the edge on to the floor.

Lift Gates.

Stand No 81, Row D.

Messrs. Joseph Richmond & Co., Ltd., of 30, Kirby Street, Hatton Garden, E.C., who have a model of their automatic electric passenger and hand-power and electric dinner lifts on show, have one feature of particular interest, namely, a gate for use with their automatic lifts. This removes the objection with such lifts of the doors swinging out and blocking narrow passages (a folding gate being impossible of adoption for obvious reasons). The gate is made in two halves, and thus only swings out a small way. It is only unlocked by the lift moving a cam-arm. If accidentally pushed open when the lift is passing, the lift immediately stops, so obviating accidents.



Weldon Stone.

Stand No. 11c, Row F.

Samples of this well-known stone, and also a beautiful old date stone 1690, showing its extraordinary weather-resisting properties, are to be seen at this stand. Weldon stone is a typical oolite composed of oolite spherules and shell fragments of the more durable form of carbonate of lime bound together by sub-crystalline calcite. Its chemical analysis, as made by Professor Attfield, Ph.D., F.R.S., &c., is as follows :—

Carbonate of lime	94·35
" magnesia	3·55
Iron (as peroxide)	·61
Alumina	·28
Silica	·08
Moisture, with traces of organic matter, manganese, &c.	1·13
	100·00

Its specific gravity is from 2·42—2·45. It saws readily without water, and is therefore a cheap and easy stone to work, whilst at the same time it hardens rapidly by exposure to the weather. The stone is delivered on Midland rails at Weldon and Corby for 1s. 4d. per ft. cube. Blocks are quarried up to 80ft. cube, though the general average is 16ft. Weldon stone has been used in many important buildings in this country—for example, in the new tower to Rochester Cathedral, completed last year—and architects concerned with church-work especially should take occasion to examine it. Samples will be forwarded on application, and the quarries can be viewed by appointment with the manager, Mr. John Rooke, Weldon Grange, Corby, Kettering.

A Superb French Stone.

Stand No. 80, Row D.

Though used for some of the most important buildings and monuments on the Continent, more especially in Paris, the fine marble stone called "Echaillon," exhibited at this stand, has only quite recently been introduced in this country, and as yet has only been used in a few buildings here, among which we may mention that staircases and paving at the new Ritz Hotel in Piccadilly will be of this stone. The quarries where it is obtained are about twelve miles from Grenoble, in the south of France, and are very old, though the working of them has been spasmodic owing to political and financial difficulties. Now, however, the most up-to-date plant has been installed, and the proprietors are able to cope with all requirements. Echaillon is a coralline limestone, almost pure, in some cases showing traces of magnesium, but in no way argillaceous. It is quarried in three colours, white, yellow and pink, and by reason of its great density, close grain and exceptional strength and hardness is specially suitable for the finest class of sculpture, as well as work of utility such as staircases, paving, sinks, &c. White echaillon is particularly effective when finished with a matt polish, whilst yellow and red can be highly polished. The sole agents for Great Britain and the Colonies are Messrs. Dawson & Co., Ltd., of Mendip Wharf, Battersea.

The Baryta Treatment of Stonework.

Stand No. 91, Row E.

The exhibits of Messrs. Julius Hülsen & Co., of Collingwood Street, Newcastle-on-Tyne, are baryta-water for the treatment of stonework, and precipitated carbonate of barytes for the prevention of scum and discoloration on facing bricks, terra-cotta, tiles, ridges, quarries, &c. (samples showing the difference between the same seams of clay when burnt with and without an admixture of this chemical). Professor Church's report on the baryta treatment of decayed stonework was given in our columns when it was published last year. From the experiments made on the chapter-house of Westminster Abbey and elsewhere it is clear that this is the best known treatment for decayed stone, and every architect should make himself familiar with it. The baryta-water is applied, preferably, with a diffuser, and the chemical changes brought about by its use are mainly these :—The soluble sulphate of lime, that is, gypsum, in the decayed stone is converted, in part or wholly, into soluble sulphate of baryta, with the simultaneous production of hydrate of lime. The latter will be changed gradually into carbonate and will then have re-assumed its original state. It is to this change that the hardening and consolidation of the decayed stone are mainly due, but it may be weeks or in some cases months before the process is complete. The experience of four years indicates that the baryta-treatment involves no risk of bad consequences, though it is possible that, after the lapse of a decade or two, further treatment with baryta may prove desirable.

A Destructor for Hospital Refuse.

Stands Nos. 5 and 6, Rows B and C.

Just as cremation will ultimately supersede the old method of burial, so in the future the disposal of town and trade refuse by being burned in suitable furnaces will be exclusively adopted in place of shovelling into pits and leaving the slow processes of Nature to reduce all to earth. Destructors are now commonly employed by private as well as municipal bodies, and in this connection we may draw attention to the patent hospital type exhibited at this stand by Messrs. Meldrum Brothers, Ltd., of Timperley, near Manchester. For infectious-diseases hospitals especially it is essential that the refuse shall be dealt with absolutely without risk of contagion, either by inefficient transfer, incomplete combustion or the dissemination of noxious gases. To this end Messrs. Meldrum's destructor is designed, and all architects interested in the subject will do well to inspect it.

Electric-light Gas-engines.

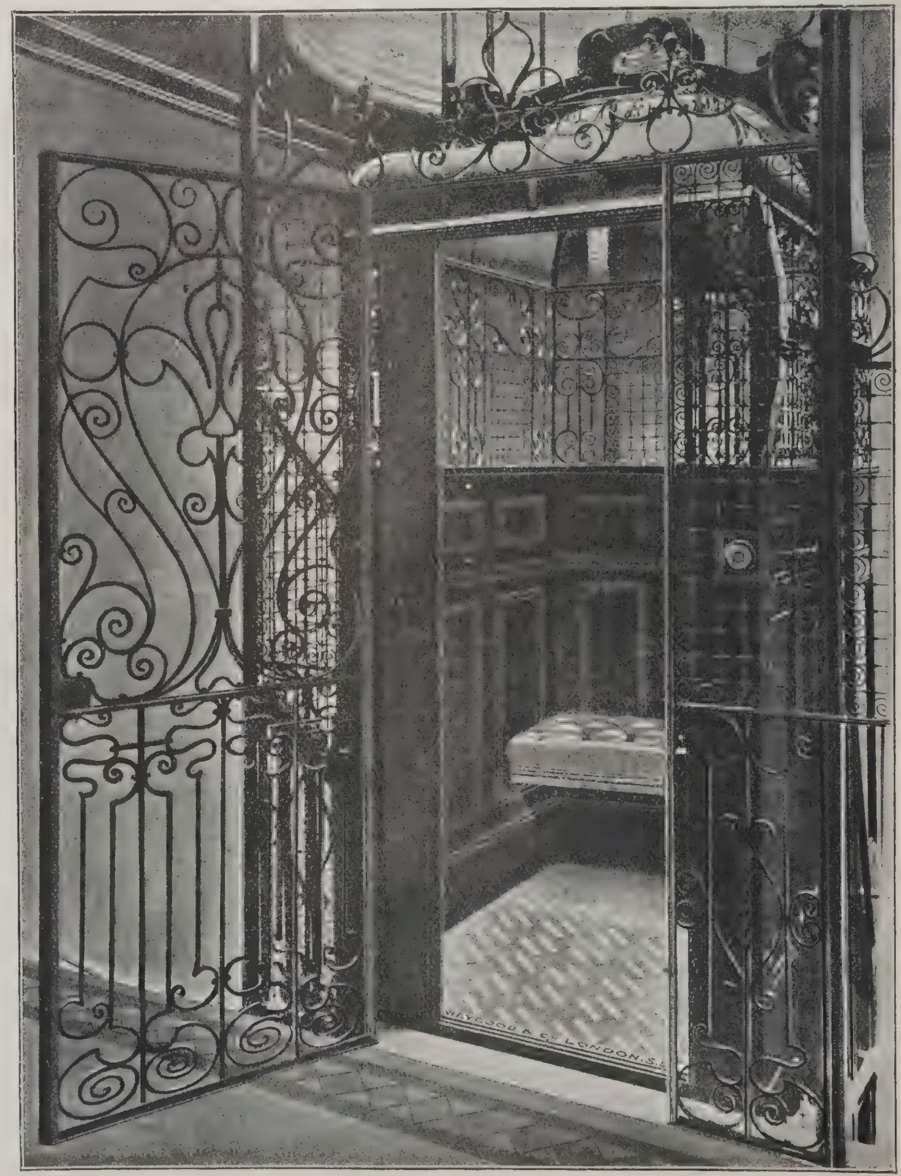
Bay 13.

The National Gas Engine Co., Ltd., of 75A, Queen Victoria Street, E.C., show one of their 8-b.h.p. special electric-light gas-engines, coupled direct to the crank-shaft of a 6-k.w. dynamo, from which set 90-16-c.p. lamps can be supplied. They also show a new type 1¾-b.h.p. high-speed gas-engine, arranged to run from 500 to 650 revolutions per minute. This little engine has been specially designed for small private-house installations, and will therefore be of interest to many architects.

A Passenger Lift.

Special Position No. 11.

We illustrate below the passenger lift exhibited at this stand by Messrs. R. Waygood & Co., Ltd., of Falmouth Road, Great Dover Street, S.E., of which some particulars were given on p. 230 of our issue for last week. This lift can be fitted with the automatic gear operated by buttons in the cage by which it is possible to bring the lift to any floor, without an attendant. The advantage of such a system is obvious.



PASSENGER LIFT BY WAYGOOD & CO.

COLUMBIAN FIREPROOFING Co., LTD.,

37, KING WILLIAM STREET, E.C.

CONCRETE FIREPROOF FLOORS

AND

Reinforced Cement Pipes

FOR

WATER OR SEWAGE SYSTEMS

A FEATURE.

Write or Telephone for Catalogue.

J. D. O'BRIEN,

Telephone: 5060 Bank. Managing Director.

Brick Fireproof Partitions.

Bay, No. 12.

The Hempstead Patent Brick Co. are showing their partition blocks, which we noticed in our columns some time ago in connection with a test which was performed specially for us. The clay of which these blocks are made is very remarkable, being able to withstand a heat sufficient to melt steel. Tests have proved beyond doubt that partitions constructed of these blocks will resist the greatest heat for any length of time without expanding sufficiently to cause the slightest bulging or raising the temperature of the outside sufficient to ignite a match. The application of water from a hose has no effect. This firm show a new fireproof door which should be of the greatest service. It is constructed of these clay partition blocks in an iron frame, and plastered in cement. If a door were constructed to slide in a partition formed of these blocks, no ironwork need be exposed, only the blocks facing the flames; thus making an effectual barrier. The use of the slabs for ceiling protection is illustrated in a little building which forms a striking feature of this stand. The cost of these partition blocks is very little, and they are made with great accuracy, so that only a finishing coat of plaster is required. They will take nails or screws readily.

Slag Wool and Partition Blocks.

Special Position No. 8.

Messrs. Frederick Jones & Co., of Rylands Road, Kentish Town, are exhibiting their slag wool or silicate cotton, the many advantages of which are so well known as to need no emphasis on our part. This is a fireproof non-conductor of cold and sound, and is vermin-proof. The loose slag wool for pugging purposes is exhibited sandwiched between galvanized wire netting, so as to form a convenient felting for insulation. Another feature is the use of metal lathing instead of the wire netting for holding the slag wool. Sheets formed in this manner can be used for protecting girders, columns, &c., or for application to studded partitions, the metal lath affording an excellent key for plaster or cement. Messrs. Frederick Jones & Co. are the makers of the partitions with helical channels and interlocking edges for grouting well-known under the name of "Hercules," and another design, with mortices at the ends, to form dowels with plaster grouting. Fibrous plaster slabs are an invaluable help in construction, and are far superior to the ordinary plaster.

Fire-resisting Partitions, &c.

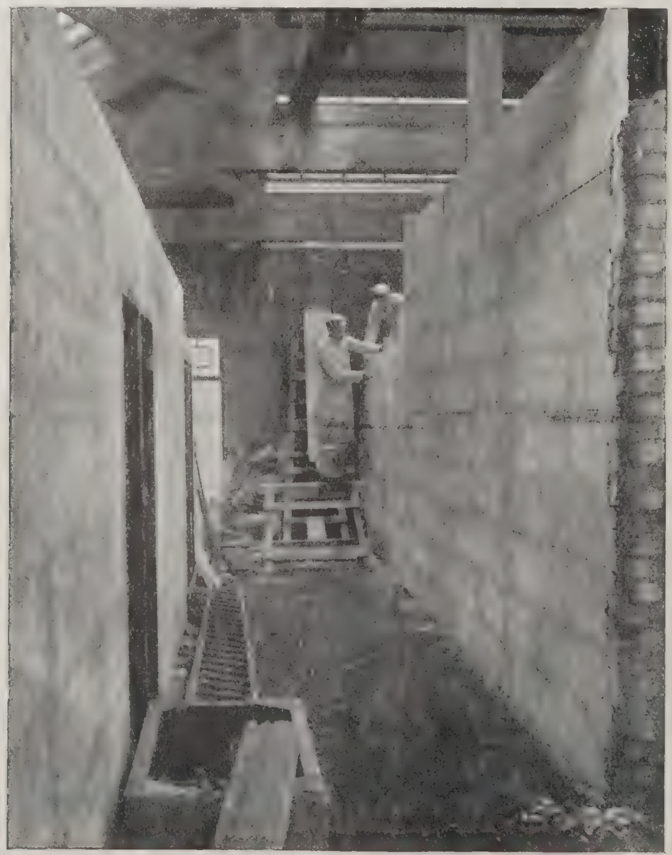
Bay No. 20.

To take something which has already passed through fire, either by natural or artificial means, is the only sure basis for a fire-resisting material. Hence at this stand we see the application of a volcanic ash to partitions, and for floor, stanchion and girder casings. The exhibit is that of Messrs. Horace W. Cullum & Co., of Craven House, Kingsway, W.C., and the name of the material "Kulm." This is not used in the form of mortar, but made up into slabs of different sizes which, for partition work, are nailed on to battens, or nailed into one another when used for encasing ironwork, &c. Thus, as the slabs can be nailed, there is no necessity for grounds or plugging for fixing skirtings, architraves, &c. No wires or iron rods are used in erection, and it is claimed that the partitions are absolutely rigid and soundproof. As to their fire-resistance, it may be stated that "Kulm" partitions have withstood a two hours' test by the British Fire Preventive Committee, obtaining the highest class for a width of $2\frac{3}{4}$ins.

Mack Slabs.

Stand No. 57, Row C.

In our last issue we referred to Messrs. J. A. King & Co.'s stand. We now publish an illustration showing the erection of a partition of their 2in. slabs at the new baths at Warrington (Mr. Thomas Beesley, architect). Several interesting applications of this firm's manufactures are shown, of which we may specially mention the method of column protection, their fibrous plaster slabs, and their slabs with tiles in the face, giving the appearance of brickwork.



ERECTING PARTITIONS WITH "MACK" SLABS AT WARRINGTON PUBLIC BATHS.

Plate Wall Partitions.

Stand No. 63, Row C.

In our notice of the partitions of the London Fireproof Plate Wall Co., Ltd., of 60, Watling Street, E.C., on p. 227 of our issue for last week, the reference to internal rods is misleading, as these are only necessary when extraordinary heights have to be built. The company show a suspended wall without any rods or ironwork—held in position by side grip simply—but this is only a novelty to show how floors can be relieved of weight. The slabs used are grouted together so as to become one solid piece, and being smooth on the face no finishing coat is required, and they may be papered or distempered shortly after erection. They are also made rough, with finishing coat, for tiling, &c.

Tubular Partitions and Floors.

Bay No. 3.

The British Fireproof Construction Co., of 11, Queen Victoria Street, E.C., are showing their partition blocks, terra-cotta tubes for floors and reinforced concrete floors. The partition blocks or tubes are 3ins. thick and hollow and weigh 14 lbs. per ft. super. when fixed. At the ends is a groove which carries the breeze-concrete joints that give strength and to which fixings can be nailed. These blocks are made in several sizes. The floor tubes are from $5\frac{1}{2}$ins. to $10\frac{1}{2}$ins. deep, 12ins. to 15ins. wide, and $\frac{3}{4}$in. thick. These tubes form a permanent ventilating centering for the concrete, which is little in amount. A reinforced concrete slab 12ft. from centre to centre designed to carry a distributed load of $1\frac{1}{2}$ cwts. per ft. super., with a factor of safety of 3, is shown carrying a load of 5 cwts. per ft. super. with a deflection of only $\frac{1}{2}$in.

Combination Baths and Kitcheners, &c.

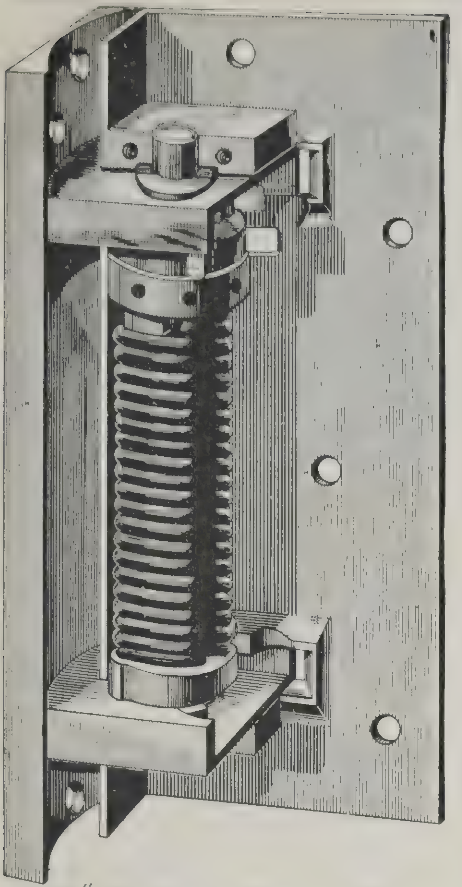
Stands No. 1, Arcade, and No. 127A, Wall Space.

The Ellkay baths are now well-known. They offer such advantages as to saving of space that they commend themselves. The company have now combined with the business of Mr. James Cornes as Ellkay & Cornes, Ltd., the capital of which is £80,000, so that they are now enabled to push their various specialities on a scale appropriate to their value. The patent combined kitchen-range, boiler, bath and copper invented by Mr. Cornes has been used in many workmen's dwellings. It saves much space and enables the working classes to be given comfort. The whole combination is most ingenious, and the cost is not prohibitive even in the cheapest houses. Another noteworthy feature is the enamelled steel bath in one piece. The advantage of steel is that the bath heats up so much more quickly when water is turned in.

Reinforced Concrete.

Stand No. 72, Row D.

The insistence of reinforced concrete upon the attention of the building public in the present day lends an interest to the exhibit of Messrs. Potter & Co., Ltd., 66, Victoria Street, who are showing various types of fireproof floors and their application of concrete. We draw attention to a little treatment which is interesting, namely, theatre steppings, as executed at the Chelsea and Walthamstow theatres, &c. These are constructed upon a permanent centering of corrugated galvanized sheets bent to special form. By this means the costly, elaborate and obstructive temporary boarding is avoided, and the time necessary to complete the work is considerably lessened. Fronts of balconies, galleries, boxes and crush barriers are formed by Messrs. Potter of concrete and small steel tension rods. The firm uses a special form of reinforcing rod, namely, corrugated. As several others are of a very different shape, the nearest description is to call them waved. Potter's well-known Century floor cramp, the great advantages of which are well known, is also exhibited.



THE "NEW IDEA" HINGE BY NORTON & GREGORY, LTD.

A New Spring Hinge.

Stand Nos. 21 and 22, Rows B and C, Gallery.

The accompanying illustration shows a new spring hinge which has been introduced by Messrs. Norton & Gregory, Ltd., of Castle Lane, Buckingham Gate, S.W. The great feature of this hinge is that it can be fixed on the door instead of in the floor, and thus it is specially adaptable to doors over concrete floors or girders, and in other positions where the fixing of floor springs would be extremely difficult if not impossible. As will be seen, the device is very simple in construction, consisting of two parts, one for fixing to the stile of the door and the other to the jamb, with the spring mounted on a pin between. The hinges, as supplied, are at the proper tension for ordinary doors, but the tension can be readjusted to suit any requirement. These hinges are made in polished gunmetal, bronze plated, or japanned iron, at prices ranging from 6s.

To Supersede the Old Method of Hanging Sashes.

Stand No. 99, Row E.

The breaking of sash lines and the jamming of pulley wheels are too often experienced to call for comment; hence the introduction of many devices to supersede the ordinary method of hanging windows. At this stand will be seen a patent pulley with specially strong teeth for use with a hardened steel chain. The workmanship of both is excellent. The device is applicable to new or old windows and is a great improvement on the ordinary method. It has been employed in numerous Government buildings, important hospitals and large business premises. The makers are the Rhodes Patent Sash Hanging Co., of Fairholt Road, Stoke Newington, N.

Columbian Fireproofing and Reinforced Concrete Pipes.

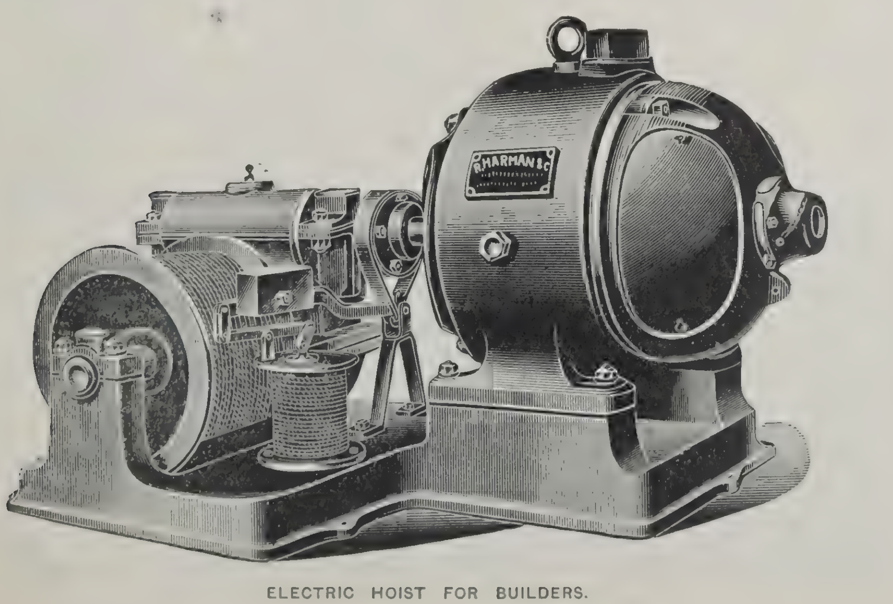
Stand No. 54, Row C.

In our last issue we made some reference to the exhibit of the Columbian Fireproofing Co., Ltd. We would add that their stand is one of the most striking in the hall. Consisting of a high steep roof with dormers, resting on piers, it is an exemplification of what is being done by this firm at the Ritz Hotel, the Waring Building, and the Shipping Combine's offices in Cockspur Street, London. At this stand a special feature is made of reinforced concrete pipes executed on the Bonna system, the patent rights of which have been acquired by the company. The advantages of these for water (under any pressure) or drainage systems is great, and the company are now prepared to take contracts for this class of work.

Electric Hoist for Builders.

Wall Space No. 127.

We give on this page an illustration of an electric hoist specially designed to meet the requirements of the building trade, as described on p. 224 of our issue for last week. This hoist, of which the makers are Messrs. R. Harman & Co., of 10, Westmoreland Buildings, Aldersgate Street, E.C., allows the most delicate adjustment to be effected—so desirable in the case of moving building materials on to scaffolds, and it has the special advantage of a mechanical break operated by an electro-magnet, which is only released when the attendant has the operating lever in action; thus avoiding all danger of the hoist running down in the event of the lever being suddenly released. This hoist has been supplied for several large building works, including the new Ritz Hotel in Piccadilly, where it is used by the Columbian Fireproofing Co. On this job during eight working weeks it lifted 11,000 super. yds. of concrete for double-construction ceilings and floors—60 tons per day—at the speed of 100ft. per minute, at a cost for current of 1d. for 3 tons.

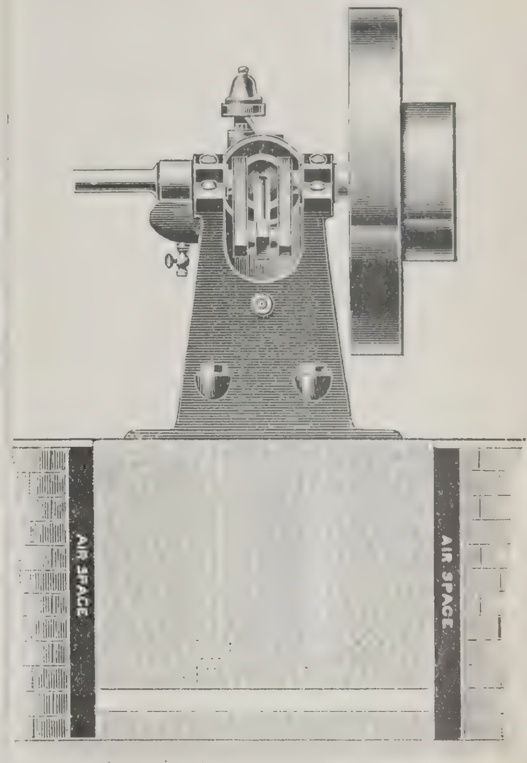


ELECTRIC HOIST FOR BUILDERS.

Impregnated Foundation Felt.

Stand No. 89, Row E.

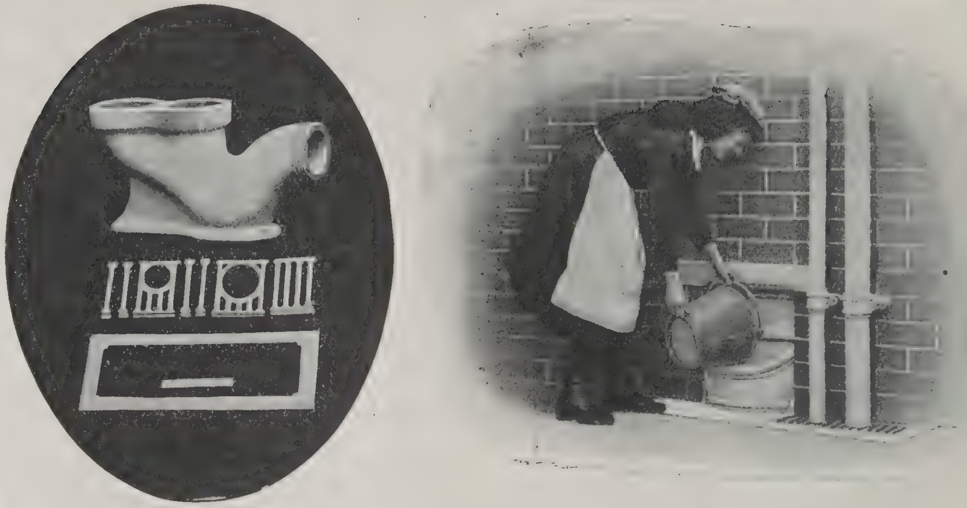
The reduction of vibration has become a very difficult problem with engineers and architects nowadays, and various expedients have been adopted to minimize the effects. It has been established that the imposition of a layer of some elastic material eliminates vibration to a very great extent, and probably the most serviceable of these is the patent impregnated felt made at Leeds by Messrs. Mitchells, Ashworth, Stansfield & Co., Ltd. (whose London office is at 12, Newgate Street, E.C.). This felt can be used for a variety of purposes in building and engineering work—such as for beds and filling for joists and stanchions, bridge work, engine foundations, &c.—and may be depended upon as thoroughly efficient. It is made entirely from wool, impregnated on the surface by a chemical process and in the body of the felt with a special oil, rendering it firm and impervious to moisture. There is no fear of the felt being pulped or squeezed out, but at the same time it retains the qualities of elasticity, enabling it to greatly overcome vibration and neutralize any jarring. The felt is made in sheets of any thickness from 5 to 30 mm. ($\frac{1}{4}$in. to $1\frac{1}{4}$ins.), the largest sheets measuring 5ft. by 2ft. 6ins. We give an illustration showing how it may be applied to engine beds. A layer of felt is interposed between the upper concrete engine-bed and the concrete foundation, and bolts are carried from each to the other and an air-space left on either side. This isolation, and the fact that the bolts holding down the engine bed are not continuous, prevents the vibration being transmitted, and the felt eliminates it. It will be seen what a saving is thus effected over the massive spreading foundations otherwise necessary. A non-flammable hair felt for insulating walls is also made by Messrs. Mitchells, Ashworth, Stansfield & Co., and should prove highly advantageous for protecting roofs and partitions, particularly as regards the latter, as it is a very efficient deadener of sound and would cure many a distressing echo.



Slop Chutes.

Stand No. 18, Row D, Gallery.

The exhibit of Messrs. J. Hirst & Son, of John William Street, Cleckheaton, will not be passed unnoticed by architects, as a very excellent sanitary device is shown, namely, a patent sanitary slop chute, with channels and grates, which has been recently awarded two bronze medals by the Sanitary Institute. We give two illustrations of them on this page. The Local Government Board's by-laws require an open channel, and the constant trouble which is caused by falling leaves, &c., stopping this up can only be prevented by a grating. Messrs. Hirst's patent grating has obvious advantages in this connection, as it is constructed in several parts, which can be shifted into convenient positions for the reception of fall-pipes, no cast-iron shoes being required. One illustration shows these fall-pipes, and the other illustration shows the method of releasing various portions of the grating by knocking out the key; this key, being on the end side, cannot be interfered with without removal and exposes no loose parts. Where the Local Government Board by-laws are not in force, various other forms can be used, as shown at this stand. The advantages of these slop chutes over the old-fashioned shallow slop dishes are obvious, for by their adoption leakages into foundations, smells and diseases are obviated, while the sink waste pipe is reduced in length and properly protected. One sanitary trap only is required and one connection to sewer. No blocking can take place. All parts are accessible and easily fixed, and the appearance is neat. A special form is made flush with the outside wall. At this stand is also shown a standard patent system of paving for roadways and pavements. This consists of inserting a thin strip of metal between the course of paving, this preserving the edges of the setts and preventing the road wearing down unevenly. The life of roadways paved on this system has been proved to be double that paved in the ordinary way; and there are many other points which will occur to those who have to deal with roads.



PATENT SLOP CHUTE BY J. HIRST & SON.

Setts.

Gallery Bay 6.

All kinds of setts are shown at this stand by Messrs. Brookes, Ltd., of 16, Great George Street, Westminster, Halifax, London, Manchester, &c. Chief prominence, however, is given to the "Ystehede" granite setts from the firm's Scandinavian quarries. These are blue and grey and are very close grained, with the mica uniformly distributed with the harder particles, ensuring perfect foothold on any gradient. The face, ends and edges are specially dressed to reduce noise to a minimum, as well as the quantity of pitch required for grouting. A portion of tramway track affords a good example of the appearance and quality of the setts, while an admirable series of photographs illustrates the process of quarrying and the method of shipment and transport. Coping, curbing, chippings and macadam are also exhibited, the last including the "Naesnes" variety, which is very tough and durable.

Non-slip Flags.

Gallery Bay 5.

The drawback to many artificially-made stones when used for paving purposes is that they wear to a very slippery surface, and therefore become really dangerous on staircases and steps. At this stand are shown numerous examples of a patent artificial stone which is free from this defect, being of such a texture as to wear like York stone. The exhibit is that of the Hard York Non-slip Stone Co., of 16, Great George Street, Westminster. Flags both red and white are supplied complete for laying in footways and cut for coal plates, &c., some, too, being grooved to carry away water and afford a good foothold. These flags have been supplied for numerous important works, including work for H.M. the King at Windsor and for more than 400 corporations and public bodies. The stone of which these flags are made is also used for architectural dressings, an example of which is shown at this stand in the shape of a facsimile of a window-head in the new head-offices of the company at Lightcliffe, near Halifax.

Sorel Cement.

Stand No. 70, Row D.

Sorel cement—that remarkably strong magnesian cement—was invented many years ago, but has been little known. The Rock Manufacturing Co., of Grays, Essex, who manufacture it, are showing artificial stone made with it. They also make a feature of "Rockwood" flooring composed of wood fibre and Baralite cement and laid *in situ*, upon any surface. The sale of the cement alone is also being pushed.

Standard Baths.

Although the Standard Sanitary Co. have no stand, a number of their baths are exhibited by various firms, and attention to these is drawn by the excellent finish inside and outside the baths.

Reversible Sash Windows.

Special Position No. 9, Row B.

The number of reversible sashes exhibited at the hall is large, but Webber's patent, shown by the Amhurst Building, Joinery and Patent Window Frame Syndicate, Ltd., at the stand of Messrs. Durolite, Ltd., is truly remarkable for the simplicity and quickness with which the operation of reversing the sashes may be performed, namely, in 4 seconds by one used to it. Casements that can be turned inwards by the same principle are shown. These exhibits deserve notice for their extreme simplicity.

Bitumen Damp-course and Sheeting.

Stand No. 77, Row D.

Messrs. George M. Callender & Co., Ltd., of 25, Victoria Street, Westminster, S.W., show various samples of their pure bitumen damp-course and the method of its application to different kinds of buildings. They have also constructed a tank on the floor of the hall, which is made watertight by means of their pure bitumen sheeting—a material largely used for lining reservoirs, swimming baths, ponds, tanks, ornamental lakes, filter beds, bacteria filters, &c. The damp-course and sheeting are manufactured from pure Trinidad bitumen, without the admixture of coal tar or pitch of any kind.

New Door Spring.

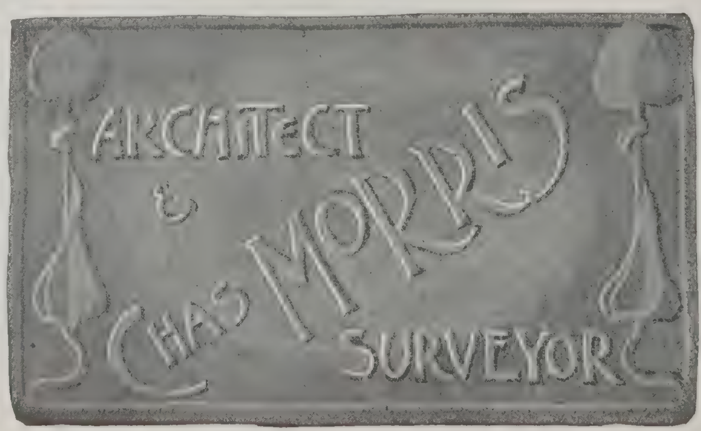
Stand No. 48, Row B.

The "Quadrant" door spring and the "Unique" reversible window sash are shown by Messrs. Martin's Patents Co., Ltd., of 11 and 12, Finsbury Square, E.C. The former consists of a curved tube fixed at one end to the door and at the other end to the frame. Inside the tube is a strong spring. A pin is fixed on top of the door and presses against the spring as the door is opened, while the spring presses against the pin and closes the door automatically when the latter is released. For ordinary single doors the price in polished brass is 12s. and for swing doors 22s.

Architectural Terra-Cotta.

Stand No. 96, Row E.

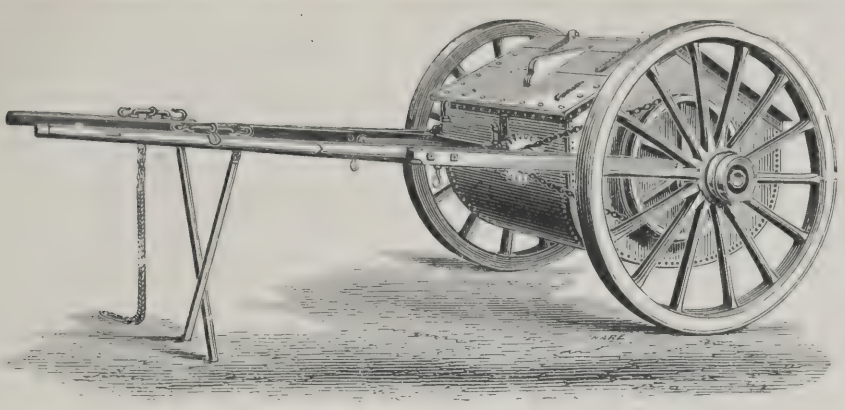
We regret that in the notice of the exhibit of Messrs. Carter & Co., of Poole, on p. 219 of our issue for last week, we inadvertently referred to stands "showing the latest patterns in wallpapers." We should have said "wall tiling." These patterns are very well chosen and are worthy of the attention of all architects and builders.



Name-Plates for Architects.

Wall Space No. 137.

The accompanying illustration shows one of the numerous signs made by The Brilliant Sign Co., Ltd., of 38, Gray's Inn Road, W.C., makers of all kinds of letters, facias, wall signs, &c. Many of the new designs made by this firm will be found to be a great improvement on the usual fancy styles, and as such we draw attention to them.



A MORTAR TUMBLER CART BY BARROWS AND CO., LTD.

A Mortar Tumbler Cart.

Bay 4.

Messrs. Barrows & Co., Ltd., of Cherwell Works, Banbury, Oxon, show an 8-n.h.p. single-cylinder portable engine, a No. 2 improved London timber trolley, an improved 200-gallon mortar tumbler cart fitted with eccentric balancing axle, and a portable under-geared 6ft. mortar mill with vertical engine and boiler combined, mounted on high travelling wheels. The last-named is found to be very useful in cases where the ordinary separate type of mill and portable engine is out of the question. It can be drawn directly on to the site and set to work within an hour, and is consequently specially suited for small jobs where it is not worth the trouble and expense of fixing a separate mill and engine.

Wallpaper Trimming Machines.

Stand No. 24, Row A.

Mr. James Oates, of 33, Trinity Street, Huddersfield, exhibits the "Empire" and "Express" wallpaper trimming machines in operation, a special feature being made of some attachable fittings enabling paperhangers to quickly trim "relief" materials. The "Express" machine is guaranteed to trim both edges clean and accurate and to rewind the thickest 12 yd. roll of "Lincrusta" "Lignomur," "Cameoid," "Anaglypta," &c., in one minute, automatically guiding the material. The prices of these machines range from £7 18s. to £9 15s. With an "Empire" machine 800 pieces of wallpaper can be trimmed in the time taken to trim 100 pieces with scissors or straight-edge tool. This machine is made in two patterns—one for papers up to 21ins. wide (price £2 19s. 6d.) and the other for papers up to 30ins. wide (price £3 12s.).

Automatic Gas Lighting.

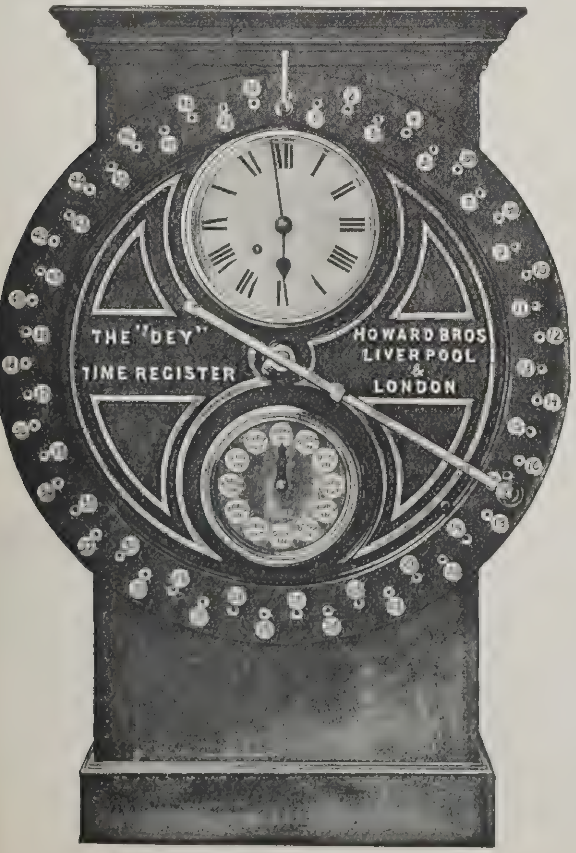
Stand No. 4, Gallery.

Mr. L. Soman, of 21, Redcross Street, E.C., shows the "Conus" gas lighter (a German invention). This is a very simple device, consisting of a piece of platinum wire inside a spiral attached to the top of the chimney. This wire becomes incandescent when the stream of gas issues, and the lighting is therefore automatic. Its special feature is, of course, that the gas consumption of a by-pass is done away with. Numerous devices of this nature have been invented, but as a rule they have suffered from fragility and short life. The "Conus," we understand, is free from these drawbacks. Its price is 1s. Mr. Soman also manufactures a pneumatic gas-lighter by which the gas can be turned on from a distance by merely pressing a button, the "Conus" doing the rest.

Time Registers.

Stand No. 46, Row B.

Time registers are indispensable in all large works and factories. Much ingenuity has been expended on them, and they are now perfect for all practical purposes. The "Dey" time register made by Messrs. Howard Brothers, of 100c, Queen Victoria Street, E.C., has several special features. It is very simple in construction, always accurate in working, and complete in itself, the record being made by each workman simply moving the pointer round to his number and pushing it in: thus doing away with all keys, checks and tallies. Each record is separate, and no matter in what order the employees arrive or leave, their numbers are bound to appear in consecutive order on the time sheet, with all the registrations for day or week printed in bold type in one line opposite each man's number. The ribbon which inks the type is fed automatically, requiring no attention for a year or so, and the register is provided with plate-glass doors on either side, thus allowing the record to be seen at a glance. The daily time-slip is ready for pay roll when it leaves the register, and can be pasted in the wages book. No transcribing of any kind is necessary. In conjunction with these time sheets there is an attachment which records on cards the time spent by workmen on outside or inside jobs, for the purpose of cost keeping. The rate at which the "Dey" time register can be used may be gauged from the fact that 2,000 men can record their time on ten machines in four minutes. Among London building trade firms who use the register may be mentioned Messrs. Holloway Brothers, J. Carmichael and George Trollope & Sons.



Contractors' Railways, Concrete Mixers, &c.

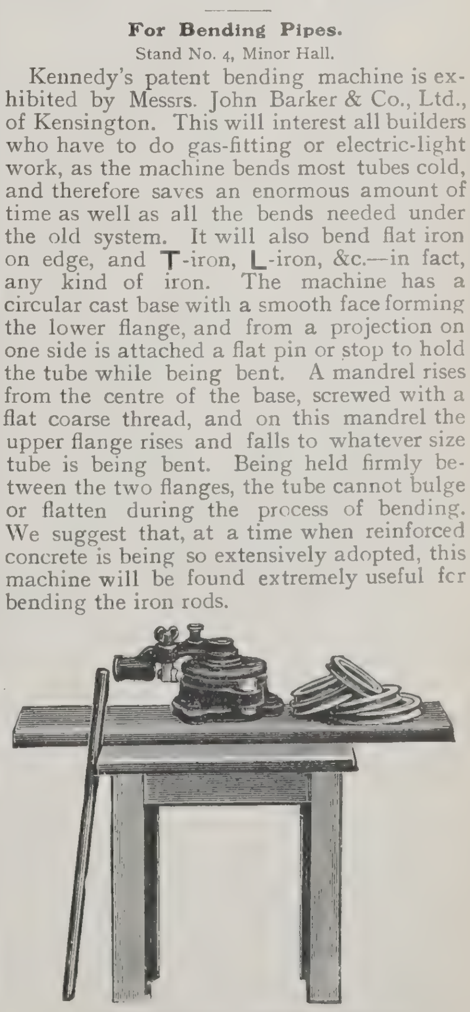
Bays 22, 23 and 24; Stand No. 2, Minor Hall.

As indicated above, Mr. Arthur Koppel has two stands, the latter consisting of a length of track around the minor hall where a neat little hydroleum locomotive runs to and fro. This small engine is made from 5-h.p. to 20-h.p., suitable for gauges between 18ins. and 24ins., and has a water-tube boiler fired by liquid fuel—such as Texas fuel oil, kerosene, water gas tar, &c. An oil-engine is undoubtedly the most efficient source of power yet discovered, and this small hydroleum locomotive embodies the best features of the machines of its class. The oil-feed and the water-feed are both automatically regulated, and there is consequently no stoking work, as with coal- and coke-fed boilers. For places where coal is dear, and for intermittent work, this engine is cheaper to work than the ordinary type; moreover, full working pressure can be raised in ten to thirteen minutes. Contractors will find this exhibit of much interest. The concrete mixer, too, calls for attention. This is all of iron and comprises a measuring box into which the material is tipped or shovelled, the box being then raised and the aggregate discharged into a feed hopper, whence it falls into a drum fitted with blades for thoroughly mixing the contents. Water is admitted by a pipe as required. When the mixing is complete a sliding cover on the drum is drawn aside and the concrete falls into wagons or barrows below, the opening and closing of the cover being automatically effected by the drum in course of rotation.

For Bending Pipes.

Stand No. 4, Minor Hall.

Kennedy's patent bending machine is exhibited by Messrs. John Barker & Co., Ltd., of Kensington. This will interest all builders who have to do gas-fitting or electric-light work, as the machine bends most tubes cold, and therefore saves an enormous amount of time as well as all the bends needed under the old system. It will also bend flat iron on edge, and T-iron, L-iron, &c.—in fact, any kind of iron. The machine has a circular cast base with a smooth face forming the lower flange, and from a projection on one side is attached a flat pin or stop to hold the tube while being bent. A mandrel rises from the centre of the base, screwed with a flat coarse thread, and on this mandrel the upper flange rises and falls to whatever size tube is being bent. Being held firmly between the two flanges, the tube cannot bulge or flatten during the process of bending. We suggest that, at a time when reinforced concrete is being so extensively adopted, this machine will be found extremely useful for bending the iron rods.



KENNEDY'S PATENT BENDING MACHINE.

Sheet-lead Damp-course.

Stand No. 74, Row D.

The exhibit of Messrs. Höfler, Ltd., of 26A, Soho Square, W., is divided into five sections, comprising French and German wallpapers, &c. Section 2 is devoted to Höfler's patent asphalted sheet-lead damp-course, a model exhibiting the adaptability of this material for railway work. It has been specified and used for many years by architects on the Continent. It is now being laid by the firm at the electricity generating station of the Westminster Corporation at Duke Street, Mayfair, under the supervision of Mr. C. Stanley Peach, F.R.I.B.A., the well-known architect. Permission having been obtained for the Corporation to excavate under an existing open space in Duke Street, this has been done to the depth of about 30ft., providing for the construction of a very capacious machinery hall. This extends 8ft. above the level of the roadway, and over it an Italian roof garden is being arranged, approached by flights of steps at either end. It was of course very necessary to prevent any damp percolating through from the garden on to the electrical machinery beneath, and Höfler's damp-course was selected for this important undertaking. It is laid over the concrete screeding, the whole afterwards being given a coating of volcanic cement; on top of this the damp-course is floated with cement and covered with tiles in geometrical design, the tiling being also carried out by the firm. Our illustration represents the work of laying the damp-course.

The Northern Polytechnic Institute's Exhibit.

Stand No. 26, Row A.

At this stand are shown examples of the work done by students in the building trade workshops of the Northern Polytechnic Institute, including a stone pedimented niche (after the design of Mr. E. W. Mountford, F.R.I.B.A., at the Liverpool School of Science building), some tracery work in Caen stone (based upon vaulting at All Souls' College, Oxford), various specimens of monumental masonry in Carrara marble and of turned and polished alabaster work, including an example just returned from the Institute's exhibit at St. Louis Exhibition. Similarly, from other workshops are niches in plaster-work and brick; doors, screens and dado framing in hardwoods, lead rainwater heads, and examples of signwriting from the painters' and decorators' classes. From the building and drawing classes are examples of class and homework drawing, including some measured drawings of St. Saviour's, Southwark. Apparatus used in class teaching is illustrated by lantern slides and models, in addition to which are samples of materials, and photographs of classrooms, together with apparatus from the chemical and physical laboratories, and samples of material tested to destruction in the testing machine of the Institute. The day courses for architects, surveyors and builders are specially illustrated by very large photographs showing the junior classes engaged in practical work in the brickwork, plastering and painting workshops, these practical courses of instruction being a special feature introduced by the head af the department, Mr. Hugh Davies, the exercises corresponding partly to those of the Frankfort Art Trade Schools and partly to those of the Pratt Institute, New York. These classes, for which the splendid trade workshops are exceptionally adapted, are interesting in view of the recent declaration of the Board of Architectural Education with regard to laboratory and workshop training in architectural courses. The architectural design day classes are under the direction of Mr. Percy A. Horrocks, A.R.I.B.A., and the trade courses are under skilled trade instructors.

LAYING SHEET-LEAD DAMP-COURSE AT ELECTRICITY GENERATING STATION, MAYFAIR.

Jointless Floorings.

Stand No. 5, Gallery.

Eubœolith patent flooring is shown at this stand by Mr. J. Percy Day, of 3, Victoria Street, Westminster. This flooring has many qualities to recommend it, especially for hospitals, schools and similar buildings. First, it is jointless and thus can be kept thoroughly clean, there being no cracks for the lodgment of dirt. Secondly, it can be laid quickly and cheaply, and when set has a durable surface, though with a certain resilience and warmth which makes it far more comfortable than cement. Thirdly, it is perfectly waterproof and fire-resisting, and can be flushed with a hose if necessary so as to maintain it thoroughly clean. These are in themselves qualities enough to warrant its adoption in all places where sanitation and cleanliness are requisite: but in addition it has other features to recommend it, such as being unaffected by atmospheric changes and producing little dust. It is usually laid ½in. thick on a concrete bed left rough from the straight edge, no cement rendering being required, but it can also be laid on old wood floors, if they are of sound construction; also on flagstones that have become worn and laminated. Large quantities are in use by His Majesty's Government, and it has been adopted by some of the largest hospitals, asylums, infirmaries, schools, factories, &c. In laying "Eubœolith" on concrete the latter must be at least 4ins. thick (screedings to be avoided in all cases, and consist of good, hard clean material and of good mixture (1 part best Portland, 1 part coarse washed sand and 3 parts clean gravel or clinker)—in the case of coke-breeze this must be well screened, and no plaster or earthy matter must be used. The surface of the concrete has to be well levelled off, but left rough, and brought up to within ½in. of the finished level, and must be perfectly dry before the material is laid upon it.

A Hunting Frieze.

Stand No. 62, Row C.

At this stand Messrs. Arthur Sanderson & Sons, Ltd., wallpaper manufacturers, of 52, Berners Street, W., show a coloured hunting frieze with a surround of green ingrain paper. There are four panels to the set, one representing "The Meet," another "Gone Away," the third "Full Cry" and the fourth "The Death." Each is 30ins. deep.

A Ventilating Stove; Ranges for Workmen's Dwellings.

Wall Space 131.

Messrs. Clark, Hunt & Co., Ltd., of 159 and 160, Shoreditch, London, show (in action) the "Francome" warm-air register stove. This has an air channel at the back to prevent heat being absorbed by the brickwork, and the general construction of the stove lessens the rush of air which usually carries so much heat up the chimney. The whole interior can be drawn forward for cleaning the air channel and sweeping the chimney. Numerous mantels, overmantels, tile slabs, hearths, &c., are also shown at this stand, as well as Bailey's patent "Geyser boiler" range with porcelain-enamelled bath and sink, and the new "Huntsmonde" portable kitchener, these two ranges being specially suitable to small flats or artizans' dwellings.

Armour-bright Fireplaces; Ranges and Stoves.

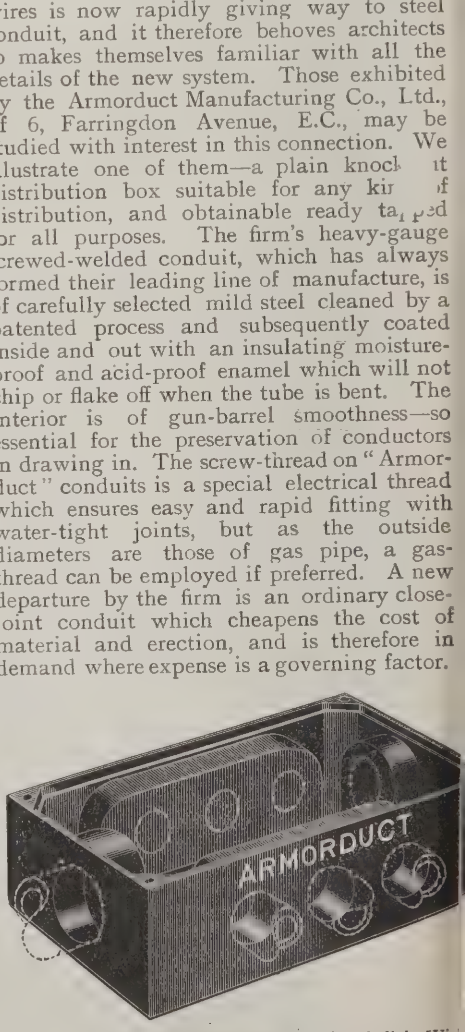
Wall Space 125.

Messrs. Smith & Wellstood, Ltd, of 11, Ludgate Circus, E.C., exhibit armour-bright fireplaces of Adam, Georgian and other periods; an independent "Durbanian" range with steam boiler, for hotel purposes; a variety of new brick-set ranges with improved iron flues, a special feature being a new coal-cooking range with gas-cooking attachment; "Francesse" and "Mutesse" continuous burning stoves for anthracite coal or coke; portable coppers for workmen's dwellings; and the "Bonnybridge" range, which is entirely independent and fitted with a high-pressure boiler. Country and borough surveyors will be interested at this stand in a large display of road indicators and motor-car signal-posts.

Conduit for Electric Lighting.

Gallery Bay No. 32.

The old wood casing for electric-light wires is now rapidly giving way to steel conduit, and it therefore behoves architects to makes themselves familiar with all the details of the new system. Those exhibited by the Armorduct Manufacturing Co., Ltd., of 6, Farringdon Avenue, E.C., may be studied with interest in this connection. We illustrate one of them—a plain knock-out distribution box suitable for any kind of distribution, and obtainable ready tapped for all purposes. The firm's heavy-gauge screwed-welded conduit, which has always formed their leading line of manufacture, is of carefully selected mild steel cleaned by a patented process and subsequently coated inside and out with an insulating moisture-proof and acid-proof enamel which will not chip or flake off when the tube is bent. The interior is of gun-barrel smoothness—so essential for the preservation of conductors in drawing in. The screw-thread on "Armorduct" conduits is a special electrical thread which ensures easy and rapid fitting with water-tight joints, but as the outside diameters are those of gas pipe, a gas-thread can be employed if preferred. A new departure by the firm is an ordinary close-joint conduit which cheapens the cost of material and erection, and is therefore in demand where expense is a governing factor.



Plain Knock-out Distribution Box for Electric-light Wir

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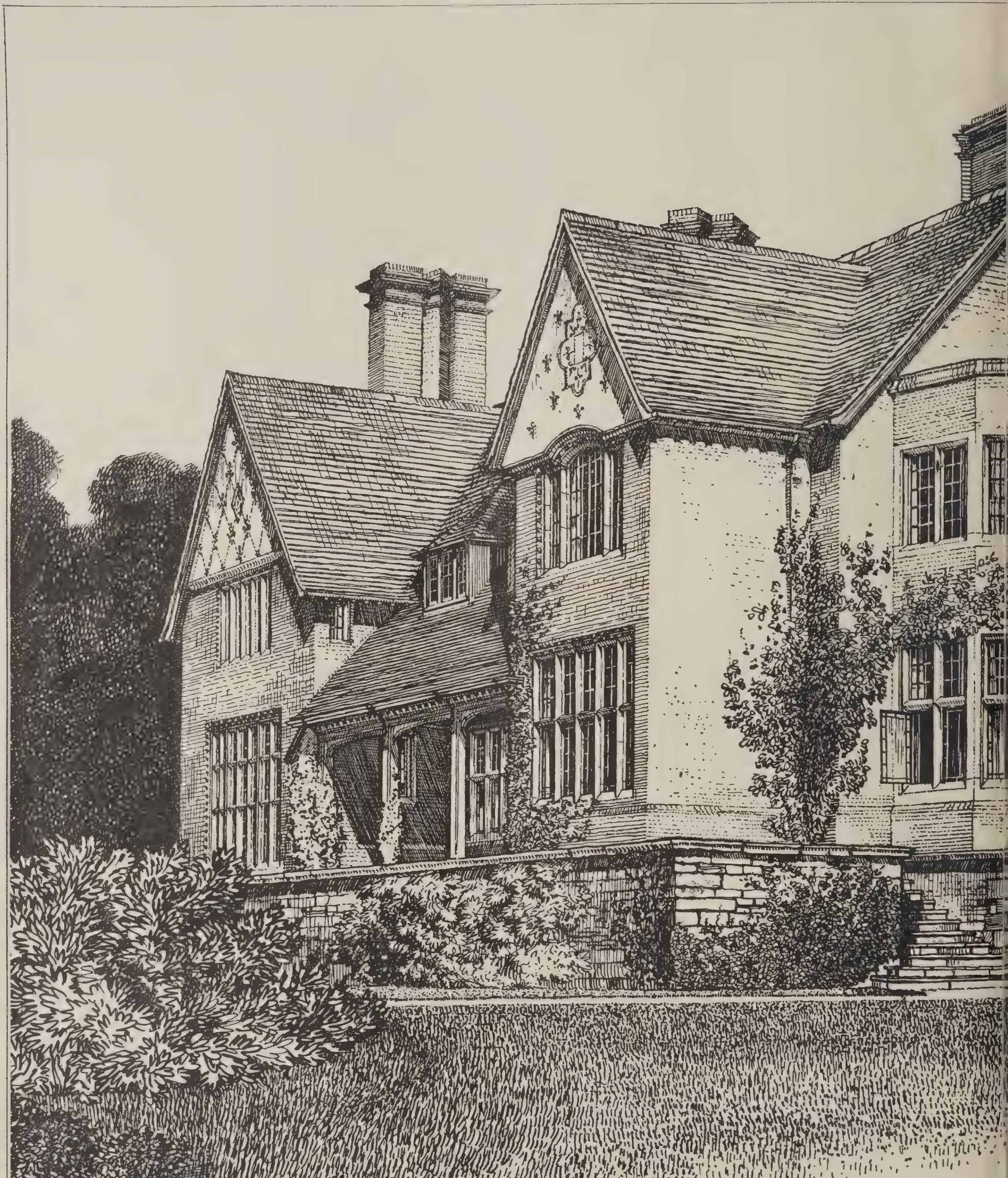
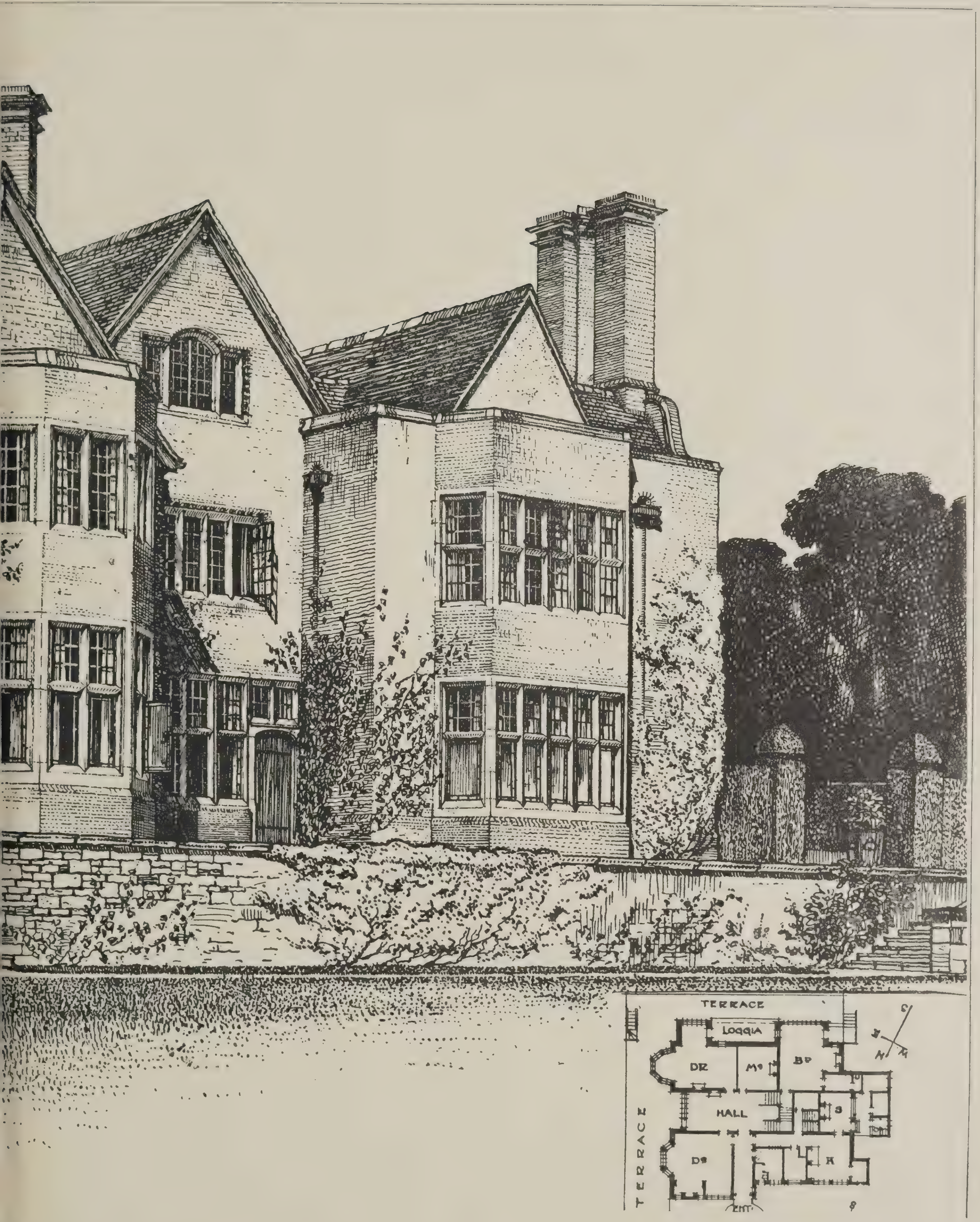
Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, May 3rd 1905.



BRACKENCLIFFE," SCARBOROUGH.



ER H. BRIERLEY, ARCHITECT.

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Correspondence.

Electric Lifts in Office Premises.

To the Editor of The Builders' Journal.

Sir,—On p. 194 of your issue for April 12th we notice some illustrations and particulars of the large block of office premises in Newcastle to be known as Milburn House. The lift service here is very complete, and we think it will be interesting to give a few facts in regard to it. The whole installation has been designed and carried out by us. The lifts are four in number and are entered from the central circular hall. They are high-speed electric passenger lifts controlled by a small switch in the cage, so arranged to give the option of running at two different speeds. These lifts are British-made throughout, and are of similar pattern to those recently erected by us in the vestibule of the Coliseum Theatre, London. To guard against all possibility of danger, the lifts are supported by four steel wire ropes, any one of which will bear ten times the weight of the cage with its full complement of passengers; and these ropes are connected to a gravity safety gear so constructed that the mere stretching or breaking of the rope has the immediate effect of stopping the cage.

Should the attendant fail to stop the lift at the top or bottom floors, three separate and distinct automatic devices are provided in order to bring the cage gently to rest, as if operated by the attendant.

It will thus be seen that every care has been taken to make these lifts as perfect and safe as possible; and in this connection it is interesting to note that although the safety gear mentioned above has already been fitted to upwards of five thousand lifts, not one failure has yet been recorded.—Yours truly,

ARCHIBALD SMITH & STEVENS.

Battersea, London.

GLASGOW INSTITUTE OF ARCHITECTS.

At the recent annual general meeting of this Institute—Mr. John Keppie, F.R.I.B.A., presiding—the secretary read the thirty-seventh annual report, which made appreciative reference to the new course of study for students of architecture to be followed jointly in the Glasgow School of Art and the Technical College, under the general direction in both institutions of M. Eugene Bourdon.

The Royal Infirmary Reconstruction.

In regard to the proposed reconstruction of the Glasgow Royal Infirmary it was stated that a communication had been received from the Glasgow Archæological Society intimating that they had appointed a committee to co-operate with the Institute and kindred associations with a view to opposing the adoption of any design which would result in permanent injury to the external effect of the cathedral, and recommending the preparation of a drawing for publication showing the cathedral and reconstructed infirmary side by side, so that the dwarfing effect of the latter might be realized by the public. A committee was thereupon appointed to deal with the matter, with powers to obtain the drawing suggested. The Glasgow Art Club have also appointed a committee in connection with the matter. The joint committee representing the three bodies mentioned has held several meetings, and although no formal report has yet been submitted it is understood that the drawings have been prepared, with the result that the apprehensions felt and expressed by the Institute have been fully justified.

The council for the ensuing year was elected as follows:—Messrs. A. N. Paterson, John Keppie, Horatio K. Bromhead, James Lindsay, T. L. Watson, James M. Munro, Alex. M'Gibbon, A. Balfour, Charles Gourlay, Thomas Baird, junr., R. D. Sandilands, James K. Hunter, J. M. Crawford, George Bell, Alex. Skirving and David Barclay.

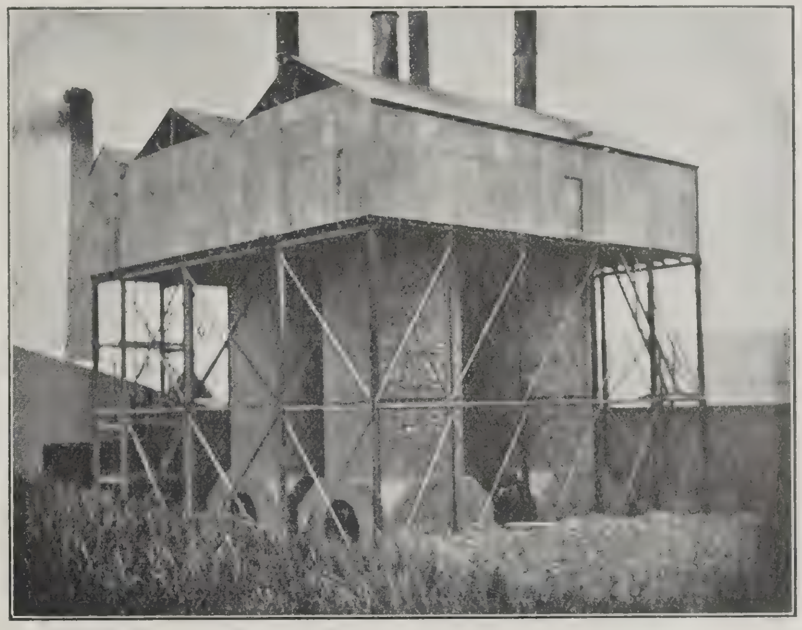
Mr. Keppie was re-elected president and Mr. James M. Monro vice-president.

CEMENT-MAKING IN SCOTLAND.

The First Works.

Though enormous quantities of cement are used in Scotland, yet the making of cement has not succeeded. Efforts were made to establish a factory near Glasgow, and more recently there was an endeavour for a company to start operations at Inverkeithing, near the new Forth naval base, but nothing practical came of the scheme. Thanks, however, to the enterprise of the Caledonian Cement Co., the first manufactory in Scotland is now in full working order at Cousland, which is a little hamlet about ten miles from Edinburgh, with a branch of the North British Railway Company's line from Ormiston passing close to the village and connected by a siding with the new cement works.

For many years limestone was burned at Cousland, and the old limekilns are still there, though now unworked. The limestone in the vicinity is of excellent quality, and is closely mixed with shale. The quarries are of the open surface order, and there is a practically unlimited supply of stone and shale.



SCHNEIDER CEMENT KILNS, COUSLAND, NEAR EDINBURGH.

Trollies take the material in its raw state to the engine-house, where a cable is attached to them and they are let down the incline to the works, which for convenience to the railway have been placed in the valley.

Galvanized iron has been plentifully used in the construction of the works—walls and roofs being of it. A brick cottage forms the office and laboratory. The stone and shale are dumped into the crushers, and thereafter until the material leaves the brick presses it is not handled at all. Screw-conveyors take it from mill to mill, and the factory is so planned that the raw material goes in at one end and arrives in due course at the kilns at the other end of the range of buildings. From the kominors the material is taken to the tube mill, being mixed on the way in right proportions of stone and shale. The chemist attached to the works draws samples every hour and tests them in the laboratory. From the tube mill the finely-ground mixture in a dampened state is made into briquettes by two brick presses having an output of 20,000 briquettes per day. These mills are by Messrs. Herbert Alexander & Co., of Leeds.

The briquettes are laden by hand on to trollies and sent up electric hoists to the top of the kilns—of which there are four, of the Schneider upright type—where they are burnt, and afterwards raked out as clinker, which is ground to a fine powder and stored ready for loading into trucks.

The works produce about 300 tons of cement per week, and there is ample room for extension. A Shank's engine supplies the motive power, being fed by two boilers, supplied by a Motherwell firm. Electric light is installed throughout, as Cousland is in a colliery district and coal is obtainable cheaply. Cottages for the employees have been erected in the village.

There is a ready market for cement in Edinburgh and Leith, Dundee and Glasgow. Some very large contracts have been in hand of late, the largest being that for the new waterworks at the Talla and the pipe line to Edinburgh, which is now almost completed. The Birmingham Waterworks used more than 120,000 tons of cement, and the Talla is on an even larger scale. Although quantities of foreign cement are imported, notably Belgian and German, it is satisfactory, from the British maker's point of view, to note that the Harbour Commissioners of one of the leading Scottish ports who had fixed a contract for one of the best-known German brands on the score of cheapness have just broken off the contract and refused to take delivery, as they found the quality was not up to specification. They have now returned to British makers. The Belgian cement has been offered at a ridiculously low price ex ship at Leith or Granton, but is made from the natural rock, and is not nearly so uniform nor so reliable as British cement.

Obituary.

Mr. Charles Longley, timber merchant, of Hayward's Heath, died recently, aged 65.

The late Mr. S. J. Thacker, A.R.I.B.A., of Rottingdean, left estate of the value of £60,194.

Col. Bird, C.B., died recently. He was well-known in the London building trade, having been one of the founders of the Institute of Builders. He was also the father of the Tylers' and Bricklayers' Company and managing director of the Builders' Accident Insurance Co.

Keystones.

Mr. C. Dickens-Lewis, of Shrewsbury, has been appointed school architect to the Cardiganshire County Education Authority.

A new Church at Edinburgh, in Ormidale Terrace, is to be built from designs by Mr. A. Hunter Crawford, F.R.I.B.A.

American Banks form the subject of a special issue of the "Architectural Review" of Boston, U.S.A., for March, price two dollars (8s. 4d.). Scores of excellent illustrations are given.

A new Bridge at East Molesey has been erected at the entrance to Hampton Court Railway Station. It will be reserved for pedestrians, whilst the old structure will be used for vehicular traffic.

Mr. Alfred Waterhouse, R.A., who was seized with paralysis some time ago, has not been so well of late, and has been unable to take carriage exercise in the neighbourhood of his country residence, Yattendon Court, near Newbury.

The new Olympia Theatre, Liverpool, in West Derby Road, seats 3,750 persons and has been constructed upon a scale twice as large as that of the London Hippodrome. No fewer than thirty-six exits have been provided. The arena is 42ft. in diameter.

The Forgetful Architect.—The man who built a house and forgot to put in the stairs has been overshadowed by the Swansea Corporation. They are building a fire-brigade station, and have just discovered that they have forgotten to provide room for the horses!

Competition for Clock Tower, St. George's Circus, S.E.—This competition has been decided as follows:—1st, Mr. J. F. Groll, Westminster; 2nd, Mr. Leslie Wilkinson, Ealing; 3rd, Mr. Alexander Peacock, Finchley. One hundred and six designs were received. Messrs. Thomson & Pomeroy were the assessors.

At the Royal Academy Banquet held on Saturday at Burlington House H.R.H. the Prince of Wales said that while visiting India next winter he hoped to lay the foundation-stone of the Queen Victoria Memorial Hall at Calcutta (designed by Sir William Emerson), "the first great architectural work which India under the British Crown has inaugurated."

Competition for new Parish Church, Epsom.—The following seven architects have been selected to submit designs for this church (each to receive £20):—Messrs. W. H. Bidlake, Nicholson & Corlette, Temple Moore, J. Bannister, C. H. M. Mileham, Charles Spooner and J. Hatchard Smith. Mr. G. H. Fellowes Prynne is the assessor. The building is to cost £14,500 and to seat 100 worshippers.

The Vauxhall Bridge Works have now been in progress for six years and a half, and in all probability another year will elapse before the structure is open to the public. The work has been given in two contracts. Messrs. Pethick Brothers were the contractors for the demolition of the old bridge and the construction of the new piers and abutments for a sum of £167,675, while Mr. C. Wall has the contract for the erection of the superstructure at a cost of £142,942. Nearly 300 men are employed. The materials required include 4,000 tons of steelwork, 250 tons of cast-iron work, 300 tons of cast steel, 100,000 cub. ft. of granite, 30,000 yds. of concrete and 100,000 ft. of timber. The work is being carried out under the direction of Mr. Maurice Fitzmaurice, chief engineer to the London County Council, and under the immediate supervision of Mr. Copperthwaite, bridges engineer to the Council, who, however, has only been associated with it for three years.

The Ruins of the Old Walls of Berwick-on-Tweed, including the ancient bell tower, are to be taken over by the Board of Works and enclosed as national relics.

The R.I.B.A. Examinations will be held on the following dates:—Preliminary, June 6th and 7th. Intermediate, June 6th, 7th, 8th and 9th. Final and special, June 23rd to 30th.

"Architect" or "Architect and Surveyor."—The Council of the Institute has passed a resolution expressing the opinion that members should not publicly designate themselves otherwise than as above.

The Oldest House in Winchester—an old Tudor timber house in Cheesehill Street—has come into the market on the death of the owner, and unless purchased by the Corporation, or some public-spirited person, is likely to be demolished.

Fulham Town Hall is to be enlarged at a cost of £25,000, in order to provide the mayor with a suitable parlour and give increased accommodation to the town clerk's and borough engineer's departments. The scheme provides for a projecting clock on the façade.

Leicester and Leicestershire Society of Architects.—In the thirty-second annual report, for 1904-05, just issued, extended reports are given of the papers on architects' registration by Mr. Cross and Mr. Hubbard. Six excellent reproductions are included of measured drawings of St. Nicholas's Church, Leicester, by Mr. J. F. J. Goodacre.

Lock-out of Tyneside Bricklayers.—No settlement has been arrived at in connection with the building trade dispute on Tyneside. The employers state that they are prepared to employ any man at the reduced rate of 9d. per hour and under the new rules, but the men remain firm against making any concession except on minor points.

The Restoration of the Parthenon was the most interesting subject under discussion at the recent Archæological Congress at Athens. It is reassuring to learn on the authority of M. Kavvadias that nothing in the shape of restoration, as the word is commonly understood, will be attempted in regard to either the Parthenon or any other of the ancient temples of Greece. He is of opinion that the fallen columns should be raised, and in this most persons will agree with him, though the late Mr. Penrose deprecated the idea on the ground that any effort to imitate the exquisite workmanship displayed in the fitting of the standing columns could only result in failure.

Indignant Manchester Architects.—Further protests were made at the annual meeting of the Manchester Society of Architects last Thursday against the action of the Lancashire County Council in deciding that all architectural work in connection with school buildings shall be left in the hands of an official of the county council instead of being thrown open to the profession at large. Another matter touched upon was the manner in which objections to plans lodged by architects with the Manchester Corporation were notified. Any objection to the passing of such plans was communicated not only to the architect, but to the owner of the building as well, and under such a system there was a probability of the former's interests being injured. It was decided to approach the committee concerned by deputation. Mr. J. H. Woodhouse, F.R.I.B.A., was elected president and Messrs. C. H. Heathcote, F.R.I.B.A., and J. W, Beaumont, F.R.I.B.A., vice-presidents. Council: Messrs. John Ely, J. B. Gass, E. Hewitt, Jesse Horsfall, A. H. Mills, J. D. Mould. Isaac Taylor, G. H. Willoughby, P. S. Worthington, Godfrey Colles, A. H. Corbett and J. H. Gibbons.

R.I.B.A.

Annual General Meeting.

THE annual general meeting of the Royal Institute of British Architects was held on Monday evening at 9, Conduit Street, W. The annual report of the Council was presented. Most of the facts therein stated have already been published in our columns, but we may give the following as fresh information or worthy of publication as official statements:—

The present membership is 1,904, as compared with 1,829 last year and 1,787 for 1903.

Colonial Examinations.

The first intermediate examination held out of the United Kingdom took place last November in Sydney, when three candidates were examined. The Board of Examiners have not yet reported the result, the papers having only just come to hand.

The special examination for Colonial candidates will be held this year in Canada and Sydney.

Registration.

The Registration Committee appointed last session began their labours too late for any effective result, as the Council elections in May very considerably changed the personnel of the committee. Early in the present session the new committee appointed a sub-committee, which has met monthly, holding morning and afternoon sittings. A Bill for the enrolment of qualified architects prepared by the sub-committee with the assistance of counsel has been considered by the general registration committee, who have referred it back to the sub-committee for emandation. The Registration Committee hope to submit it for the adoption of the Institute at an early general meeting.

Education.

It was mentioned in last year's annual report that the Council had under consideration the proposals of a committee on architectural education consisting of members and non-members of the Institute which they had appointed. The Council have approved these proposals, and have established a Board of Architectural Education with a mandate to prepare a scheme for the co-ordination of architectural education throughout the country, and to secure, if possible, its adoption in the various schools. Of this committee Sir Aston Webb is chairman, Mr. Basil Champneys vice-chairman, and Mr. John Slater and Mr. Reginald Blomfield hon. secretaries. It consists of "Members," who are all architects, and "Advisory Members," who are representatives appointed by universities and other educational bodies. The first portion of the task has been accomplished by the Board, which is now laying the scheme before the teaching centres of the country with a view to its adoption.

Easement of Light Bill.

The judgment of the House of Lords in the case of *Colls* v. *The Home and Colonial Stores* induced the joint committee of the Institute and the Surveyors' Institution to drop Part III. of the Easement of Light Bill, which dealt with this subject, and also the only other clause relating to a change in the law, *i.e.*, Part V., headed "Right to Light passing over Streets," and the councils of the two bodies have approved the omission. The Bill as now about to be introduced into Parliament by Mr. J. Fletcher Moulton, K.C., M.P., is a Bill of Procedure, providing a simple machinery for the settlement of disputes on the lines of that already organized with regard to party-wall cases.

Board of Professional Defence.

Up to the present time the cases that have come before this Board have not been, in their opinion, of such a nature as to warrant positive action on their part.

L.C.C. Drainage By-laws.

The Council have issued invitations to those of the borough councils who expressed themselves as being in sympathy with the Institute as to the deposition of drainage plans to join the Practice Committee in a deputation to the London County Council. The Surveyors' Institution has also been invited to send representatives.

Education of the Public.

On the suggestion of the president, the Council have appointed a small committee to recommend steps whereby the ignorance of the general public in architectural matters may be somewhat mitigated. The committee have not yet issued their report.

Past-Presidents' Portraits, &c.

The Council have had an album prepared containing photogravures of the interesting collection of the portraits of past-presidents. Blank plates have been left for the insertion of future portraits. The price of the album is two guineas. There has been a loss on this album. The cost was £145, and only six copies have been sold. The presentation of the portrait of Sir William Emerson by Mr. J. J. Shannon, R.A., will take place at an early date. Mr. Solomon J. Solomon, A.R.A., has kindly accepted the commission to paint the portrait of Sir Aston Webb.

Competition for "The Palace of Peace."

At the request of the Minister for Foreign Affairs that the Council would advise him as to two architects whose names he might submit to the Dutch Government as fitting persons to be invited to prepare designs in an international competition for the Carnegie Foundation—"The Palace of Peace"—at the Hague, and as to a third who could serve on the International Jury, the Council nominated the president, Mr. John Belcher, and Sir Aston Webb, to represent Great Britain in the competition, and Mr. T. E. Collcutt, vice-president, to serve on the International Jury. The Council have since learned through the Genootschap "Architectura et Amicitia" of Amsterdam that the Carnegie Foundation Commission have decided to throw the competition open to all architects, while at the same time specially inviting representative architects from the various countries to compete.

The Council have granted £500 to the funds of the Seventh International Congress, London, 1906, the grant to be spread over two years. The balance of income over expenditure is £1,680—the largest on record.

Committees' Reports.

The Art Standing Committee have forwarded a resolution to H.M. Office of Works that it is desirable to replace with stone the present wood pediments and drum of the dome on Somerset House, but beyond a formal acknowledgment of the Committee's letter no reply has been made.

The Science Standing Committee are considering what tests can be put in specifications when only small quantities of cement are required. They are also enquiring into the present method of applying Dr. Angus Smith's solution and other preparations for protecting iron, as well as the subject of working loads and stresses. A proposal to form a collection of building stones at the Museum of Geology, Jermyn Street, is recommended. The report on brickwork tests is in type and will be published shortly.

OUR PLATE.

"BRACKENCLIFFE," Scarborough, is in course of erection for Mr. Walter Glaisby. It occupies a magnificent site on the edge of the cliffs, overlooking the Holbeck valley and gardens. The rooms are arranged to command very fine views of coast scenery. The house is faced with red sanded Leicester bricks and Farndale stone dressings. Oak is used for all external woodwork, and dark-red hand-made tiles for the roofing. Messrs. Barry & Sons, of Scarborough, are the contractors; Mr. Soule is the clerk of works; and Mr. Walter H. Brierley, F.S.A., of York, is the architect. The drawing is hung in the Royal Academy this year.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Architects' Charges.

OVENDEN. — PERPLEXED writes: "Where an architect is called upon by his client to prepare a schedule of prices and agreement for a contractor to fill up (together with himself), and for the contractor to sign, can the architect charge for the time and labour involved in doing the work, seeing it is principally technical work within his province, or will he have to charge for the drawing-up and filling-in of schedule only, and drop the agreement, the latter being within the lawyer's province, or will the architect have to put a price merely on the 'form of agreement,' as a separate item?"

The schedule of quantities is out of the architect's ordinary work, and should therefore be charged for, but the agreement is part of his ordinary percentage.

ILLINGWORTH.—DOUBTFUL writes: "If an architect agrees at a percentage to superintend the carrying out of the excavator, mason and bricklayer's work in erecting new shop property, on the amount of the contractor's work—giving employer a note to that effect—and the proprietor provides the stone and bricks, should not the charge be on the amount of the cost of labour and materials in carrying out the work?"

The charge should be upon both materials and labour, undoubtedly.

Isolation Hospitals.

CONSTANT READER writes: "I am about to prepare plans for an isolation hospital, and should be glad to know whether any rules and regulations are issued by the Local Government Board. In a block of wards for thirty patients to cost about £4,000, and for the treatment of six or seven different diseases, is it necessary to have an isolated block for each disease, or can the whole of the wards be under one roof (a one-storey building is required)?"

We do not know of any regulations and ideas, as hospital designs are various.

Architects' Assistants in Canada.

NOTTINGHAM.—J. B. writes: "Is there a good opening for a young architect (twenty years of age) in Canada; if so, which is the best way to obtain a situation?"

There are plenty of openings for men of push, but anyone going out should have sufficient to keep him for about a year. It is practically impossible to obtain a situation from this country.

Road Construction.

LONDON.—ROUTE writes: "(1) Where it is proposed to form a road across a field at such a level that filling is required underneath the road ballasting, is it necessary or desirable from a practical standpoint to remove the turf and top spit of the field over the area of road and footpaths? (2) Where a road across a field is proposed to be in a cutting, is it the practice of quantity surveyors to measure the turf and top spit as a separate superficial item from the rest of the excavation, even though the proprietor does not want the turf preserved for his own use?"

(1) Yes, it is advisable to remove the turf and top soil, so as to allow the road to bind properly. (2) Yes; it should be so measured, and stated if to be preserved or not.

A Bridge Contract.

MERTHYR TYDFIL.—W. B. writes: A district council is erecting a bridge and making roads, footpaths, &c. The bridge is a steel girder bridge supported on abutments and piers of masonry. The council gave the construction and erection of the steelwork to firm A, and (but some time later) the construction of the bridge, masonry, roads and footpaths to B, both contracts having been tendered for in open competition. As far as can be ascertained there was no date fixed for the completion of A's contract and no penalty for non-completion by A. But B was bound to complete the bridge masonry for the reception of the girders by September 1st, and the remainder of his contract by November 1st, 1904, under a penalty of £10 per week, such penalty to be deducted from the moneys due to B, the contractor. There is, however, nothing in the contract stating that the council shall be liable to B for any delay the council may cause him. B had the bridge masonry ready for the ironwork on August 27th, 1904; but A did not bring any of the ironwork there until after November 1st, and has not even yet completed the erection. It is impossible for B to complete the masonry and other parts of his contract until A has finished, and the consequence is that B has suffered considerable damage, direct and indirect, by his plant and machinery standing idle for so many months, and in other ways. (1) Are the district council liable to B for the damage caused by the delay? (As the district council are entitled to penalty for B's delay, it would seem the council are liable to B for delay caused by them, as every agreement must be mutual. B has pointed this out to the council, but they repudiate liability.) (2) If B has no remedy against the district council, has he any against A? (3) What course do you advise B to take?"

(1) Perhaps they are, but it is inadvisable to fight, as B might be held to have agreed to wait on A, as he had a knowledge of the conditions. (2) No; A made no contract as to time with B or with the council. (3) To put up with it, without making a fuss, and rely upon others giving him equal consideration when he needs it.

Book on Essex Churches.

LONDON.—X. writes: "Please name a book giving a concise description of the principal churches in Essex."

There is no book that gives a complete list of the churches of Essex. "Ecclesiastical Architecture of the County of Essex," by James Hadfield, and "Churches of Essex," by George Buckler, give good descriptions of the better-known churches.

L. G. R.

Cement Rough-Cast.

LONDON.—D. writes: "Kindly recommend the best method of producing a good lasting rough-cast on walls in a somewhat exposed position."

Portland cement and sand 1 to 3 is the best; it can be given almost any texture, and shingled if desired. If the colour is objected to, a good white may be obtained by using silver sand or a little powdered chalk.

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
May 5	Llanartney, Wales—Bridge	Rural District Council	J. Saer, 7 Hall Street, Carmarthen.
,, 5	Langnor, Staffs—Bridge	Rural District Council	H. M. Whitehead, Crown Bridge, Penkridge.
,, 5	Barkisland, Yorks—Villa	——	C. H. Petty, 12 Waterhouse Street, Halifax.
,, 5	Maidenhead—Police Station	Standing Joint Committee	J. Morris, Broadway Building, Reading.
,, 6	Falmouth—Additions to Premises	——	Superintendent, Royal Cornwall Sailors' Home and Hospital, Falmouth.
,, 6	Pengam, near Cardiff—Four Houses	——	W. Harris, Architect, Gilfach.
,, 6	Bishop Sutton, Somerset—Reconstruction of Offices	Education Committee	School House, Bishop Sutton.
,, 6	Milverton, Somerset—Residence	Misses Kidner	F. W. Roberts, 2 Hammet Street, Taunton.
,, 6	Powick—Infant School	Education Committee	A. H. Parker, 5 Foregate Street, Worcester.
,, 8	Cathays, Cardiff—Chapel	——	W. B. Rees, 3 Dunfries Place, Cardiff.
,, 8	Aberkenfig—Chapel	——	J. & F. J. Hurley, 10 Bridgend Road, Aberkenfig.
,, 8	Bridgwater—Buildings	Co-operative Society, Ltd.	J. W. Hill, King Street Chambers, Bridgwater.
,, 8	Ilford—Cottage	Urban District Council	H. Shaw, Town Hall, Ilford.
,, 8	Landrake, Cornwall—Repairs to Church Tower	——	W. Menhinick, Landrake Village.
,, 9	Aberdare, South Wales—Station Buildings	Great Western Railway Co.	Engineer's Office, Neath Station.
,, 9	Cardiff—Thirty-six Houses	Great Western Railway Co.	Engineer's Office, Newport Station.
,, 9	Ilford—Shelter	Urban District Council	H. Shaw, Town Hall, Ilford.
,, 9	Knowle, near Fareham—Converting Store into Mortuary	Visiting Committee	W. J. Taylor, The Castle, Winchester.
,, 9	London, W.—Carriage Shed, &c.	Great Western Railway Co.	Engineer's Office, Paddington Station.
,, 11	Wilsden, Yorks—House	——	Wilson Bailey, Tanfield Buildings, Bradford.
,, 11	Cardiff—Panelling, &c., Council Chamber	County Borough	J. L. Wheatley, Town Hall, Cardiff.
,, 11	Oldbury—Block of Schools	Education Committee	A. Long, New Street, West Bromwich.
,, 13	Mountain Ash, Wales—School	Urban District Council	W. G. Thomas, Public Offices, Mountain Ash.
,, 13	Ramsgate—Flight of Steps	Corporation	T. G. Taylor, Albion House, Ramsgate.
,, 13	Weston-super-Mare—School	Education Committee	Price & Jane, Weston-super-Mare.
,, 15	Belfast—Goods Office	Gt. Northern Railway Co.	W. H. Mills, Amiens Street Terminus, Dublin.
,, 15	London, W.—Disinfecting Station	Kensington Royal Bor. Council	W. Weaver, Town Hall, Kensington High Street, W.
,, 15	Convoy, Ireland—Alterations, &c., to Premises	Convoy Woollen Co., Ltd.	M. A. Robinson, Richmond Street, Londonderry.
,, 15	Dublin—Electricity Generating Station	Port and Docks Board	J. P. Griffiths, East Wall, Dublin.
,, 19	Broad Oak—Church	——	J. E. Bowen, 78 Monnow Street, Monmouth.
,, 20	Bilston—Boys' School	Urban District Council	F. M. Cooper, Education Offices, Town Hall, Bilston.
	ENGINEERING:		
May 6	Earlestowne, Lancs—Gasholder	Urban District Council	A. Bowes, Town Hall, Earlestowne.
,, 8	Brighouse—Converting Tank	Gas Committee	Gasworks, Mill Lane, Brighouse.
,, 8	Aberystwyth—Water-supply Works	Rural District Council	R. Jones, Penrhiw, Bow Street, Aberystwyth.
,, 8	Edinburgh—Boilers	Council	Engineer, Dewar Place, Edinburgh.
,, 8	Hastings—Reconstruction of Sewer	Corporation	P. H. Palmer, Town Hall, Hastings.
,, 8	Huddersfield—Ash-elevating Plant	Corporation	A. B. Mountain, St. Andrew's Road, Huddersfield.
,, 8	Kirkcaldy—Boilers	Corporation	Borough Electrical Engineer, Electricity Works, Kirkcaldy.
,, 8	London, E.C.—Motor Coach	——	H. A. Grainger, Threadneedle House, Bishopsgate Street Within, E.C.
,, 8	Whitehaven—Dock Gates	Harbour Commissioners	Engineer's Office, Queen's Dock, Whitehaven.
,, 8	Bishop's Stortford—Boilers, &c.	Urban District Council	T. Swatheridge, 7 North Street, Bishop's Stortford.
,, 9	Banbridge, Ireland—Footbridge	Great Northern Railway Co.	W. H. Mills, Amiens Street Terminus, Dublin.
,, 13	Manchester—Exhauster, &c.	Gas Committee	C. Nickson, Town Hall, Manchester.
,, 15	Montreal—Pumping Plant	Water and Power Co.	Company's Office, 62 Alliance Buildings, 107 St. James' St., Montreal, Canada.
,, 15	Barrow-in-Furness—Bridge	Corporation	Sir B. Baker, 2 Queen Square Place, Queen Anne's Mansions, S.W.
,, 15	Irvine, N.B.—Gas Plant, &c.	Corporation	Kirkland & Capper, 17 Victoria Street, S.W.
,, 16	London, S.E.—Accumulators	London County Council	County Hall, Spring Gardens, S.W.
,, 16	Erith, Kent—Dredging	London County Council	Maurice Fitzmaurice, County Hall, Spring Gardens, S.W.
,, 16	London, S.W.—Cranes	London County Council	County Hall, Spring Gardens, S.W.
,, 20	Weston Subedge—Waterworks	Pebworth R.D.C.	E. Wadams, Union Offices, Evesham.
,, 30	Sydney, New South Wales—Refuse Destructor	Municipal Council	Acting Agent-General for State of New South Wales, Victoria St., S.W.
No date	Ilfracombe—Excavating, &c.	Urban District Council	Oswald M. Prouse, Town Hall, Ilfracombe.
	IRON AND STEEL:		
May 5	Christiania, Norway—Rails, &c.	Board of Trade	Offices of Commercial Intelligence Branch of Board of Trade, 73 Basinghall Street, E.C.
,, 5	Southampton—Rails, &c.	Corporation	H. F. Street, Borough Electrical Engineer, Southampton.
,, 8	Egremont, Cheshire—Iron, Steel, &c.	Wallasey U.D.C.	Manager's Office, Egremont Ferry, Cheshire.
,, 10	Bradford—Cast-iron Gulleys	Corporation	J. H. Cox, Town Hall, Bradford.
,, 11	East Ham—Iron Staircase	Education Committee	R. L. Curtis, 11 and 12 Finsbury Square, E.C.
,, 12	Karachi, India—Structural Ironwork	Port Trust	D. Morris, c/o H. S. King & Co., 65 Cornhill, E.C.
Sept. 1	Sydney, Australia—Iron and Steel	——	Agent-General's Office, 9 Victoria Street, S.W.
	PAINTING AND PLUMBING:		
May 6	Inverurie, N.B.—Painting, &c., Church	——	George Gray, Architect, Inverurie, N.B.
,, 6	Dartmouth—Paint, &c.	Sanitary Authority	S. J. Pope, Victoria Road, Dartmouth.
,, 8	Croydon—Painting House, &c.	Town Council	G. F. Carter, Town Hall, Croydon.
,, 8	Rhosllanerchrugog, Wales—Painting, &c., Chapel	——	J. Rodgers, High Street, Rhos, Ruabon.
,, 8	Alnwick—Fifteen Pillar Fountains	Rural District Council	H. W. Walton, Alnwick.
,, 9	Rochdale—Painting Railings at Park	Corporation	Borough Surveyor's Office, Town Hall, Rochdale.
,, 10	Bradford—Oil, &c.	Corporation	J. H. Cox, Town Hall, Bradford.
	ROADS AND CARTAGE:		
May 8	London, N.W.—Improvement Works	Hendon U.D.C.	S. S. Grimley, Council Offices, Hendon.
,, 8	Southampton—Granite and Flints	Corporation	J. A. Crowther, Market Chambers, Southampton.
,, 8	London, N.—Road Work, &c.	London County Council	Council Chief Engineer, County Hall, Spring Gardens, S.W.
,, 9	London, W.—Road Stone, &c.	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, W.
,, 10	Twickenham—Street Improvement Works	Urban District Council	F. W. Pearce, Town Hall, Twickenham.
,, 10	Edmonton and Southgate—Road	Middlesex County Council	H. T. Wakelam, Middlesex Guildhall, Westminster, S.W.
,, 10	Faversham, Kent—Road Materials	Rural District Council	J. G. Chittenden, Ashford Road, Faversham.
,, 12	Worcester—Slab-paving	Highways and Bridges Committee.	J. H. Garrett, Shirehall, Worcester.
	SANITARY:		
May 5	Lichfield—Sewage Works	Rural District Council	J. Derry, 6 Bread-market Street, St. Mary's Square, Lichfield.
,, 5	Bromley, Kent—Sewers	Rural District Council	A. Williams & Sons, 14 Victoria Street, S.W.
,, 15	Kensington—Disinfection Station	Urban District Council	W. Weaver, Town Hall, Kensington High Street, W.
,, 15	Glasgow—Sewers	Corporation	City Engineer, City Chambers, 64 Cochrane Street, Glasgow.
,, 20	Windsor—Sewerage Works	Rural District Council	A. M. Fowler, 1 St. Peter's Square, Manchester.
,, 30	Christchurch, Hants—Sewerage Works, &c.	Corporation	C J. Lomax, 28 Victoria Street, S.W.
	TIMBER:		
May 5	Southampton—Timber	——	Officer in charge of Stores, Ordnance Survey Office, Southampton.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
May 15	Rochester—Institute	50, 20 and 10 guineas	£1	William Banks, City Surveyor, Rochester.
,, 24	Harrogate—Orphanage	——	10s.	Rev. J. T. Barkley, Riche Mont, Harrogate.
Aug. 1	Perth—Reconstruction of Hall	30, 20 and 10 guineas	——	J. Begg, City Chambers, Perth.
,, 1	Perth—Erection of new Hall	50, 30 and 20 guineas	——	J. Begg, City Chambers, Perth.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

Current Market Prices

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0	1	3	0
Clover, best	per load	3	15	0	4	2	6
Hay, good	do.	3	10	0	3	15	0
Sainfoin mixture ...	do.	3	10	0	3	17	6
Straw	do.	1	12	0	2	0	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ...	per cwt.	1	0	5		—	
Colza Oil, English ...	do.	1	2	3		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0		—	
Linseed Oil, barrels ...	per cwt.	0	19	9		—	
Petroleum, American ...	per gal.	0	0	$5\frac{1}{8}$		—	
Do. Russian ...	do.	0	0	$4\frac{5}{8}$		—	
Pitch	per barrel	0	8	0		—	
Shellac, orange	per cwt.	7	5	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	4	0		—	
Tar, Stockholm	per barrel	1	6	6		—	
Turpentine	per cwt.	2	5	3		—	

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ...	per ton	80	0	0		—	
Iron, Staffs., bar ...	do.	5	17	6	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	5	0		—	
Lead, pig, Soft Foreign...	do.	12	12	6		—	
Do. do. English common brands	do.	12	17	6		—	
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14	0	0		—	
Do. pipe	do.	15	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	5	0		—	
Do. floor brads... ...	do.	9	0	0		—	
Steel, Staffs., Girders and Angles	do.	5	5	0	6	0	0
Do. do. Mild bars ...	do.	6	0	0	6	5	0
Tin, Foreign	do.	138	15	0	139	5	0
Do. English ingots ...	do.	137	10	0	139	0	0
Zinc, sheets, Silesian ...	do.	28	0	0		—	
Do. do. Vielle Montaigne	do.	29	0	0		—	
Do. Spelter	do.	24	0	0	24	5	0

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Whitewood, American, logs.	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	3	0
Fir, Dantzic and Memel	per load	2	7	6	4	15	0
Pine, Quebec, Yellow ...	do.	4	5	0	7	5	0
Do. Pitch, American	do.	2	8	0	5	15	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, Nederkalix, Yellow, 1st, 4×10	per std.	10	15	0	11	0	0
Do. Archangel, Yellow, 2nd, 3×9	do.	14	10	0		—	
Do. do. do. 4th, 3×11	do.	7	15	0		—	
Do. do. do. do. 3×9	do.	8	15	0		—	
Do. do. White, 2nd, 3×11	do.	10	5	0		—	
Do. Umba, Yellow, 3rd, 3×11	do.	9	0	0		—	
Do. Kem (White Sea), Yellow, 3rd, 3×9	do.	11	5	0		—	
Do. Petersburg, Yellow, 1st, 3×9	do.	11	5	0	13	15	0
Do. do. do. Unsorted, 3×9	do.	10	5	0		—	
Do. do. White, 1st, 3×9	do.	9	10	0		—	
Do. Kovda, Yellow, 3rd, 3×9	do.	10	15	0		—	
Do. Kemi, Yellow, 1st and 2nd, 3×9	do.	10	15	0	11	0	0
Do. Skelleftea Yellow, 3rd, 2½×8	do.	8	10	0		—	
Deals, Montreal, Yellow, pine, 1st, 3×11 & 12ft. × 13ft. ...	do.	22	15	0		—	
Do. do. do. do. do. 3×11×14ft.	do.	22	0	0		—	
Do. do. Spruce, 2nd, 3×9	do.	8	15	0	9	5	0
Do. Quebec, Spruce, 3rd, 3×9	do.	9	0	0		—	
Battens, all kinds ...	do.	6	5	0	13	10	0
Flooring Boards 1in. prepared, 1st... ...	per square	0	10	0	0	10	0
Do. 2nd	do.	0	7	9	0	10	6
Do. 3rd, &c.	do.	0	6	3	0	8	6

HARD WOODS.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	4	0	0	7	10	0
Birch, New Brunswick...	do.	2	10	0	5	5	0
Do. Quebec do. ...	do.	2	10	0	6	0	0
Box, Turkey	per ton	7	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	$3\frac{1}{2}$	0	0	$3\frac{1}{2}$
Do. Honduras ...	do.	0	0	3		—	
Do. Tobasco	do.	0	0	$4\frac{25}{32}$		—	
Elm, Quebec	per load	4	2	6	8	15	0
Jarrah, planks	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras...	per ft. sup.	0	0	$4\frac{7}{32}$	0	0	$4\frac{13}{16}$
Do. African ...	do.	0	0	$2\frac{31}{32}$		—	
Do. St. Domingo	do.	0	0	4		—	
Do. Cuba ...	do.	0	0	$3\frac{29}{32}$		—	
Do. Lagos ...	do.	0	0	4		—	
Do. Benin ...	do.	0	0	$2\frac{21}{32}$		—	
Do Tobasco ...	do.	0	0	$5\frac{13}{16}$		—	
Oak, Wainscot	per log.	2	12	6	5	15	0

New Companies.

SECURITY ELEVATOR SAFETY CO., LTD. Capital: £10,000.

AFRICAN TIMBER AND TRADING CO., LTD., to acquire the business of the Lingham Timber and Trading Co., Ltd., 506, Salisbury House, London Wall, E.C. Capital: £260,000.

PAINSWICK HILL STONE CO., LTD., The Quarries, Painswick, Gloucestershire. Capital: £2,000.

HOLLYGROVE TILERIES, LTD., 37, Newhall Street, Birmingham. Capital: £3,000.

J. E. NEWARK, LTD., wood turners, timber merchants, joiners, &c., Stoney Stanton Road, Coventry. Capital: £2,000.

Coming Events.

Wednesday, May 3.

INSTITUTE OF SANITARY ENGINEERS. — Election Committee at 3.30 p.m. Organizing Committee at 5 p.m.

SOCIETY OF ARTS.—Mrs. Burton-Brown on "Recent Excavations in Rome," at 8 p.m.

BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.—Meeting at 8 p.m.

SOCIETY OF ARCHITECTS.—Visit to Building Trades' Exhibition, Royal Agricultural Hall, Islington, at 2.30 p.m.

Thursday, May 4.

INSTITUTE OF SANITARY ENGINEERS. — Visit to Messrs. Walker, Parker & Co.'s Lead Mills, Belvedere Road, Lambeth, at 4 p.m.

CHEMICAL SOCIETY.—Meeting at 8 p.m.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—Mr. J. C. Osborne on "Card Indexing and Filing," at 8 p.m.

Friday, May 5.

JUNIOR INSTITUTION OF ENGINEERS.—Mr. James N. Boot, A.M.I.M.E., on "Condensing Plant," at 8 p.m.

Saturday, May 6.

INSTITUTE OF SANITARY ENGINEERS.—Visit to Whitstable. Train at 9.30 a.m.

ARCHITECTURAL ASSOCIATION.—Visit to the Building Trades' Exhibition at 3 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to Armstrong College, Newcastle, at 3 p.m.

Monday, May 8.

BRISTOL SOCIETY OF ARCHITECTS.—Excursion to Bath Stone Quarries.

SURVEYORS' INSTITUTION (Junior Meeting).—Mr. H. Lemmoin-Cannon on "The Public Health Act, 1875 (Sanitary Provisions)," at 7 p.m.

Saturday, May 13.

NORTHERN ARCHITECTURAL ASSOCIATION. — Students' Sketching Club Excursion.

ARCHITECTURAL ASSOCIATION. — First Summer Visit.

Monday, May 15.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Sculpture and Architecture, at 8 p.m.

SURVEYORS' INSTITUTION.—Meeting at 8 p.m.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

G. APPS, builder, Hayling Island. Adj. April 20th.

A. H. JAMES, joiner, Smallthorne. R.O. April 20th.

F. W. MATTHEWS, house decorator, Dartmouth. Adj. April 10th.

JOHNSON BROTHERS, stone merchants and contractors, Hartley. R.O. April 17th.

G. B. THURLEY, builder, Old Fletton. P.E., Peterborough Law Courts, May 19th, at 12.

H. & F. FEARMAN, builders and decorators, Hatton Garden, E.C. R.O. April 14th.

T. H. HAYES & CO., builders, East Sheen. P.E., Wandsworth C.C., May 11th, at 1.

T. M. TAYLOR, builder, Lower Ashtead. P.E., Croydon C.C., May 17th, at 11.

H. HARRIS, painter and decorator, Abertillery. First meeting, 135, High Street, Merthyr Tydfil, May 4th, at 12. P.E., Tredegar C.C., May 19th, at 10.45.

A. R. COOK, builder, Long Stratton. R.O. April 18th. First meeting, Maid's Head Hotel, Norwich, May 3rd, at 11.30. P.E., Ipswich Shirehall, May 19th, at 10.30.

A. L. LUNN, joiner, Burton-on-Trent. First meeting, O.R.'s, Derby, May 3rd, at 12. P.E., Burton-on-Trent C.C., May 10th, at 12.

J. WOODGATE, builder, Eastbourne. First meeting, Eastbourne C.C., May 4th, at 12. P.E., Eastbourne Town Hall, May 20th, at 2.30.

T. BREEDEN, gasfitter and plumber, Birmingham. First meeting, 191, Corporation Street, Birmingham, April 27th, at 12. P.E., Birmingham C.C., May 24th, at 2.

E. POPPLETON, late builder, Leeds. R.O. April 14th. First meeting, O.R.'s, Leeds, April 27th, at 11. P.E., Leeds C.C., May 15th, at 11.

F. HUNT & CO., slating and tiling contractors and builders' merchants, Southend-on-Sea. First meeting, 14, Bedford Row, London, W.C., May 1st, at 3. P.E., Chelmsford Shire Hall, May 3rd, at 10.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Abbots Langley (Herts).—For the erection of a seven-roomed house and bathroom, for Mr. G. W. Saull. Messrs. Barrett & Driver, architects, 23, York Place, Baker Street, W. :—

	£	s.	d.
Flint Brothers	£385	0	0
W. T. Halse	339	0	0
E. Glevister*	272	10	0

* Accepted. [All of Abbots Langley.]

Aberystwyth.—For the erection of new public library, for the Corporation. Mr. Payton, architect :—

	£	s.	d.
Evan Owen, Trefechan	£3,690	0	0
Owen Brothers, Aberystwyth	3,501	15	0
Lewis Bearne, Aberystwyth	3,492	0	0
Sapcote & Sons, Birmingham	3,149	0	0
Treasure & Sons, Shrewsbury... ...	3,059	0	0
W. Hopkins, Birmingham...	3,000	0	0
W. H. Thomas, Oswestry	2,995	0	0
R. Price & Sons, Shrewsbury ...	2,850	0	0
Edwards Brothers,* Aberystwyth ...	2,806	5	0

* Recommended for acceptance.

Dartford.—Accepted for the erection of four shops in Lowfield Street, for Sir James Whitehead. Mr. W. Harston, A.M.I.C.E., architect, 8, Hythe Street, Dartford :—

W. F. Blay.

(*Continued on* p. xxii.)

PERFECTION
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The "VICTOR" Double Action Spring Hinges open wider than any other—viz., 135° each way, *i.e.*, 45° beyond right angles—and close with a perfect check action.

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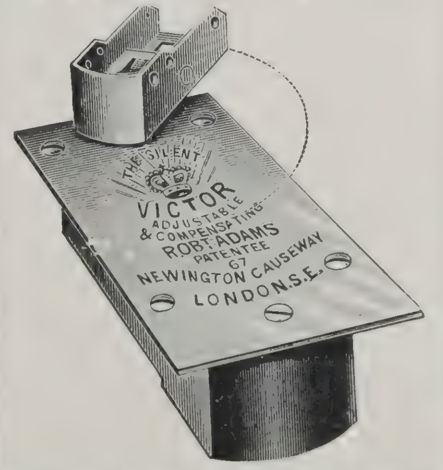

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Telephone: 829 Central.

Advertising Notes.

> *"Advertising isn't grammar: it isn't pictures: it isn't type: it isn't top-of-the-page position. Advertising is news."*

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterward, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Monday.

ARCHITECT and CIVIL ENGINEER'S MANAGING ASSISTANT desires ENGAGEMENT. Ten years' practical experience of all branches Speciality, sewage disposal.—Apply Box 1066, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT and SURVEYOR'S ASSISTANT desires ENGAGEMENT, A.R.San.I. Nine years' varied experience; measuring up, contract drawings, details, specifications, knowledge of quantities, surveying and levelling, superintending works, &c.—H., 10, Rollscourt Avenue, Herne Hill, S.E. 1069

ARCHITECT and SURVEYOR'S ASSISTANT desires engagement. Good draughtsman. Working and detail drawings. Reference from present office.—W. H. ELLISON, Senior and Clegg, Architects, Barnsley. 1090

ARCHITECT and SURVEYOR'S ASSISTANT desires RE-ENGAGEMENT. Ten years' first-class experience. Thoroughly qualified in general and detail drawings, specifications and quantities. Neat and quick draughtsman. Excellent testimonials.—ALPHA, 9, St. Mark's Road, Bush Hill Park, Enfield, N. 1106

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ARCHITECT'S ASSISTANT; aged 21; nearly five years' London experience, student R.I.B.A., design, working drawings, surveying, specifications, perspectives, and general routine; salary moderate. —M., 7, Goulton Road, N.E. 1086

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ARCHITECT'S JUNIOR ASSISTANT (22). Articled for three years, 1¼ years improver, good knowledge of construction, contract drawings, and details from sketches, surveying; good references; moderate salary.—H. N., Thorncroft, Hale Road, Farnham, Surrey. 1075

ARCHITECT'S JUNIOR ASSISTANT desires ENGAGEMENT. Good training in domestic work.—HODGSON, 1, Branksome Terrace, Bournemouth. 1094

ARCHITECT'S JUNIOR ASSISTANT desires ENGAGEMENT in London Office.—Apply Box 1102, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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BUILDER'S MANAGING CLERK (35) desires RE-ENGAGEMENT; 16 years' experience; plans, quantities, measuring and billing. Special d.e. book-keeping, profit and loss account, balance sheet, excellent references.—"PRACTICAL," 145, Alexander Road, Moss Side, Manchester. 1068

BUILDER'S or CLERK OF WORK'S ASSISTANT (22). Drawing, tracing, knowledge of quantities and details. 4½ years in Architect's office. Certificates Building Construction (Advanced), perspectives, &c.—Box 1076, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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GENERAL FOREMAN seeks engagement; thoroughly practical and energetic, well up in plans, measurements, quantities, &c.; good manager; bricklayer; age 42. Good references.—J. LAKE, 86, Melbourne Street, Gloucester. 1087

GENERAL FOREMAN wants JOB. New or alteration; 11 years with last employers; good manager of men; well up in drawings and quantities. Trade, bricklayer, age 41.—A. B., 48, Farley Road, Catford, S.E. 1093

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ARCHITECTS. Wanted PARTNERSHIP in first-class business; must be genuine; amount up to £500. State income and all particulars.—Address, Box 1098, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

Drawings, Tracings &c.

DESIGNS for SUBURBAN RESIDENCES prepared to suit clients. Plans and Specifications for new work and alterations. Drain Plans at specially low fees.—J. LAWRANCE, jun., M.R.S.I., A.I.S.E., 112, Shirland Road, W.

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WANTED—BUILDERS to send for prices of Joinery, Carcassing and General Woodwork. Special Quotations for large orders of Sashes, Frames, and Stairs.—REID, 91, Mill Hill Road, Acton. 1058

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PHOTO-COPIES, All kinds of copies, including PERMANENT BLACK LINE on CARTRIDGE or LINEN. **MODELS** OF BUILDINGS, WORKS, ETC., **LITHO-PRINTING.**
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Educational.

A COURSE of 16 LESSONS in LAND SURVEYING and LEVELLING, including use of Theodolite, will be commenced second week in May by Mr. Harold Busbridge, A.R.I.B.A., A.R C.S.; Fee (inclusive of 8 Field Lessons), £2 2s. Also a course of 8 Lessons in Sanitary Engineering; Fee, 12s. 6d. For further particulars apply 229, Burrage Road, Plumstead, S.E.

LAND SURVEYING and LEVELLING including use of THEODOLITE. My annual course of 16 Lessons, comprising 8 Lectures (Fridays) and 8 Field Lessons (Saturdays) will commence on May 12th. Number of students limited. Fee £2 2s. Also 8 Lectures on Practical Sanitary Science (Tuesdays). Fee 12s. 6d.—For full particulars apply to J. LAWRANCE, jun., M.R.S.I., A.I.S.E., 112, Shirland Road, W.

LAND SURVEYING and LEVELLING. A Course of Lectures (Thursdays) and 8 Field Lessons (Saturday or Monday afternoons at option) commence April 27th. Fee £3 3s.—G. A. T. MIDDLETON, 19, Craven Street, Strand.

QUANTITIES.—A course of Correspondence Lectures in this subject (on the London system) is now ready. Also Lectures in Estimating. For particulars apply Box 632, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

R.I.B.A. EXAMS.—Personal and Correspondence tuition; courses of any duration. Apply for syllabus to Mr. A. G. BOND, B.A. Oxon., A.R.I.B.A., 115, Gower Street, London, W.C. (late Howgate and Bond).

TO ARCHITECTS AND STUDENTS.—Student has the following BOOKS for Sale at a reasonable offer for single works or the whole. Pugin's Examples of Gothic Architecture, 3 vols., 2nd edition, 221 plates, 9½ ins. by 12½ ins.; Clutton's Medieval Architecture, 16 plates, 12½ in. by 18 in., including two of the Staircase at Blois Pub. 1856 (slightly damp stained); Kelly's Practical Masonry, 1838, 45 plates, 8½ ins. by 11 ins.; Brook's Cottage and Villa Architecture, 110 plates, 11 ins. by 8½ ins.; House for the Suburbs, 2nd edition, Morris, 9 ins. by 6 ins.—Box 1110, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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THE ARCHITECTURAL ASSOCIATION.

May 6th. Visit to the Building Trades Exhibition, Agricultural Hall, Islington, N. Members to meet at the building at 3 p.m. Members proposing to attend are requested to apply to the Secretary, 18, Tufton Street, Westminster, S.W., for tickets as early as possible.

LOUIS AMBLER,
HENRY TANNER, Jr., } Hon. Secs.

EMPLOYMENT REGISTER.

Too late for Classification.

1099.—BUILDER'S ASSISTANT (38). Life exp. London and Provinces; mod. s.; exceptional refs.; capable and energetic.
1100.—LIBRARY DESIGNING. Competition or otherwise, expert assistance rendered.
1101.—GERMAN ARCHITECT, passed Engineers' Exam. 8 yrs. exp.; practical ex. refs.; mod. s.
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1103.—BUILDER'S CLERK; 4 yrs. exp.; good draughtsman; mod. s.
1105.—ARCHITECT AND SURVEYOR'S ASSISTANT; 10 yrs. exp. in all branches; ex. refs.; quantities, specifications, &c.
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1107.—BRICKLAYER, good; ex. refs.
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1112.—ARCHITECT'S DRAUGHTSMAN; 12 yrs. exp. in good office; sal. £2 2s.

See p. xxvi *for the Employment Register.*

Contracts Open.

CONTRACTORS.

TENDERS are invited for the Erection and Completion of a Block of Dwelling-houses, Clowney Street, Glasgow.

Plans, specifications, and particulars of the work can be obtained at my office.

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TO TIMBER MERCHANTS.

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Tenders to be delivered at the Town Hall, Marylebone Lane, Oxford Street, W., on or before FOUR p.m. on MONDAY, MAY 15. Four uncreosoted samples of the blocks to accompany the Tender.

Further particulars may be obtained of Mr. J. PAGET WADDINGTON, M.Inst. C.E., Borough Surveyor, and forms of Tender may be had on application at the Town Hall.

The Council will not be bound to accept the lowest or any Tender.

By Order,
JAMES WILSON,
Town Clerk.

Town Hall,
Marylebone Lane,
Oxford Street, W.
April, 1905.

HENDON URBAN DISTRICT COUNCIL

PRIVATE IMPROVEMENTS, SECTION 150, PUBLIC HEALTH ACT, 1875.

TO CONTRACTORS AND OTHERS.

The above Council are prepared to receive TENDERS for certain works of DRAINING, KERBING, CHANNELLING, METALLING, TAR PAVING, GULLIES, and other WORKS in fully making-up Ramsey and Argyle Roads, West Hendon.

The drawings and specifications may be seen, and forms of Tender obtained from Mr. S. SLATER GRIMLEY (Engineer to the Council), Council Offices, Hendon, N.W., on deposit of £10, which will be returned on receipt of bona-fide Tender, accompanied by the schedule of prices duly priced in, excepting in the case of the accepted Tender, when such deposit will be returned on the execution of the necessary Contract and bond. Failing such execution when required, such deposit will be forfeited.

Sealed Tenders, endorsed "Private Improvements," addressed to the CHAIRMAN of the COUNCIL, to be sent to the undersigned not later than FIVE o'clock p.m. on MONDAY, the 8th day of MAY, 1905.

The Council do not bind themselves to accept the lowest or any Tender.

Dated this 20th day of April, 1905.

HENRY HUMPHRIS,
Clerk to the Council.

Council Offices,
Hendon, N.W.

To Contributors.

THE EDITOR will be pleased to consider any articles, illustrated or otherwise, dealing with old and new buildings, methods of construction, or other matter of an architectural character. He will also be glad to consider architectural photographs and sketches (the latter preferably in black and white) and measured drawings of work in this country or abroad. News items of interest to architects and builders will also be considered, provided the name and address of the sender are given; no notice will be taken of anonymous contributions. All communications should be addressed to the Editor of THE BUILDERS' JOURNAL, 6, Great New Street, E.C.

NOTICE TO OUR SUBSCRIBERS.

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The Building Trades Exhibition.

See

The **ARCHITECTURAL REVIEW**

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In connection with the Exhibition of Architects' Drawings promoted by the proprietors of "The Architect."

The Exhibition will comprise about 300 12 × 16 prints of recent work by the following well-known living Architects:—

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And of work by the following deceased Architects:—

J. F. BENTLEY, J. M. BRYDON, DECIMUS BURTON, C. R. COCKERELL, R.A., GEORGE DANCE THE YOUNGER, R. J. JOHNSON, &c.

And views of celebrated buildings, &c.

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5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS.
OFFICE: 6, GREAT NEW STREET, FETTER LANE, E.C.

TENDERS—*cont. from p. xix.*

Bury (Lancs).—For the erection of a new laundry, engine and boiler-house, chimney, and setting of two Lancashire boilers, for the Guardians. Mr. Alfred Hopkinson, architect, 15, Agar Street, Bury. Quantities by architect :—

C. Dennis	£9,000
Thompson & Brierley	8,920
C. Brierley	8,899
M. Warrington Hyde	8,650
J. Byrom, Ltd.*	8,500
Clayton Brothers, Stockport	8,414

* Accepted. [Architect's estimate £8,700.]

[To be completed in six months.]

Dartford.—For the supply and fixing of hot-water heating apparatus at Gore Farm Upper Hospital, for the Metropolitan Asylums Board :—

Moorwood, Sons & Co., Ltd., 52, Gray's Inn Road, W.C.	£6,234	0	0
C. P. Kinnell & Co., Ltd., 65, Southwark Street, S.E.	6,200	0	0
W. J. Fraser & Co., Ltd., 98, Commercial Road, E.	6,200	0	0
W. J. Burroughes & Sons, 143, Queen Victoria Street, E.C.	5,967	0	0
C. J. Worsley, Luton	5,838	0	0
Wenham & Waters, Ltd., Croydon	5,790	0	0
Lea, Son & Co., Shrewsbury	5,734	0	0
H. Goodwin, Maidstone	5,700	0	0
G. & E. Bradley, Highbury, N.	5,695	0	0
J. & F. May, Lincoln's Inn Fields, W.C.	5,657	0	0
Humphrey & Co., Nottingham	5,615	0	0
J. E. Boaz & Co., Acton, W.	5,377	10	0
A. H. Wood, 36, Victoria Street, S.W.	5,327	0	0
Death & Ellwood, Leicester	5,200	8	1
Lancashire Heating Co., Birmingham	5,200	0	0
Brightside Foundry and Engineering Co., Ltd., 28, Victoria Street, S.W.	4,995	0	0
W. Freer, Leicester	4,885	0	0
T. Potter & Sons, 44, South Moulton Street, W.	4,660	0	0
R. Dawson & Co., Ltd.,* Hartley Works, Stalybridge	4,200	0	0

* Accepted.

Great Horton (Bradford).—Accepted for rebuilding the Wesleyan Sunday schools. Mr. A. Sharp, architect, Pearl Assurance Buildings, Market Street, Bradford :—

Mason—A. Broxup & Son.
Joiner—Crabtree & Thornton.
Plumber and glazier—G. Jackson, West Bowley.
Plasterer—J. C. & A. Sunderland.
Slater—J. Smithies.
Painter—H. Mitchell.
Heating apparatus—J. Anderson, Bradford.

[Total £2,350.]

[Rest of Great Horton.]

Morpeth.—Accepted (after amendment) for the erection of cottage homes, for the Guardians. Mr. L. A. Loades, architect to the Board, 14, Market Place, Morpeth :—

R. Carse & Son, Amble and Morpeth	£2,560

Roads to be constructed by the rural district council.

Newport.—Accepted for the erection of new Roman Catholic Presbytery on Stow Hill :—

C. H. Reed	£2,300

(*Continued on* p. xxiv.)

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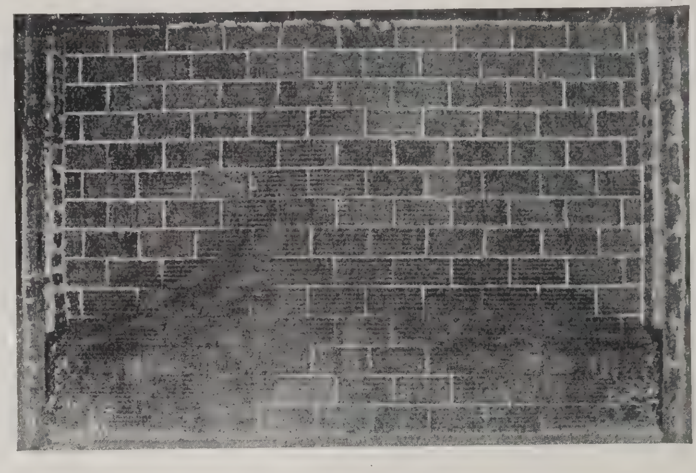

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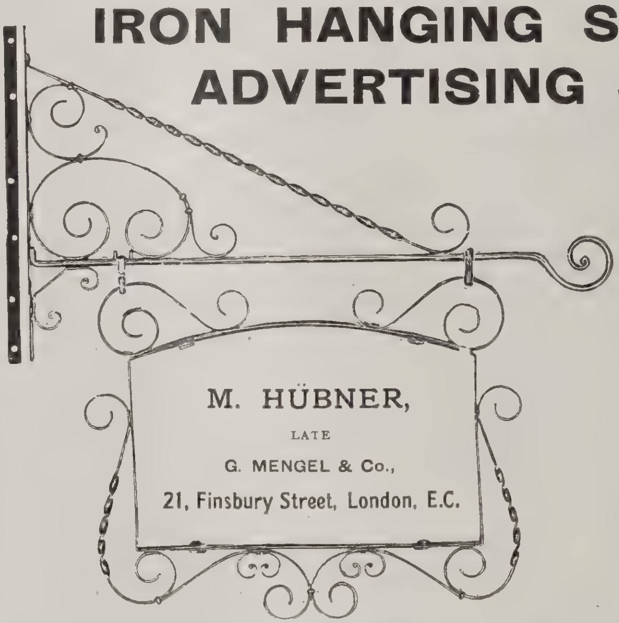

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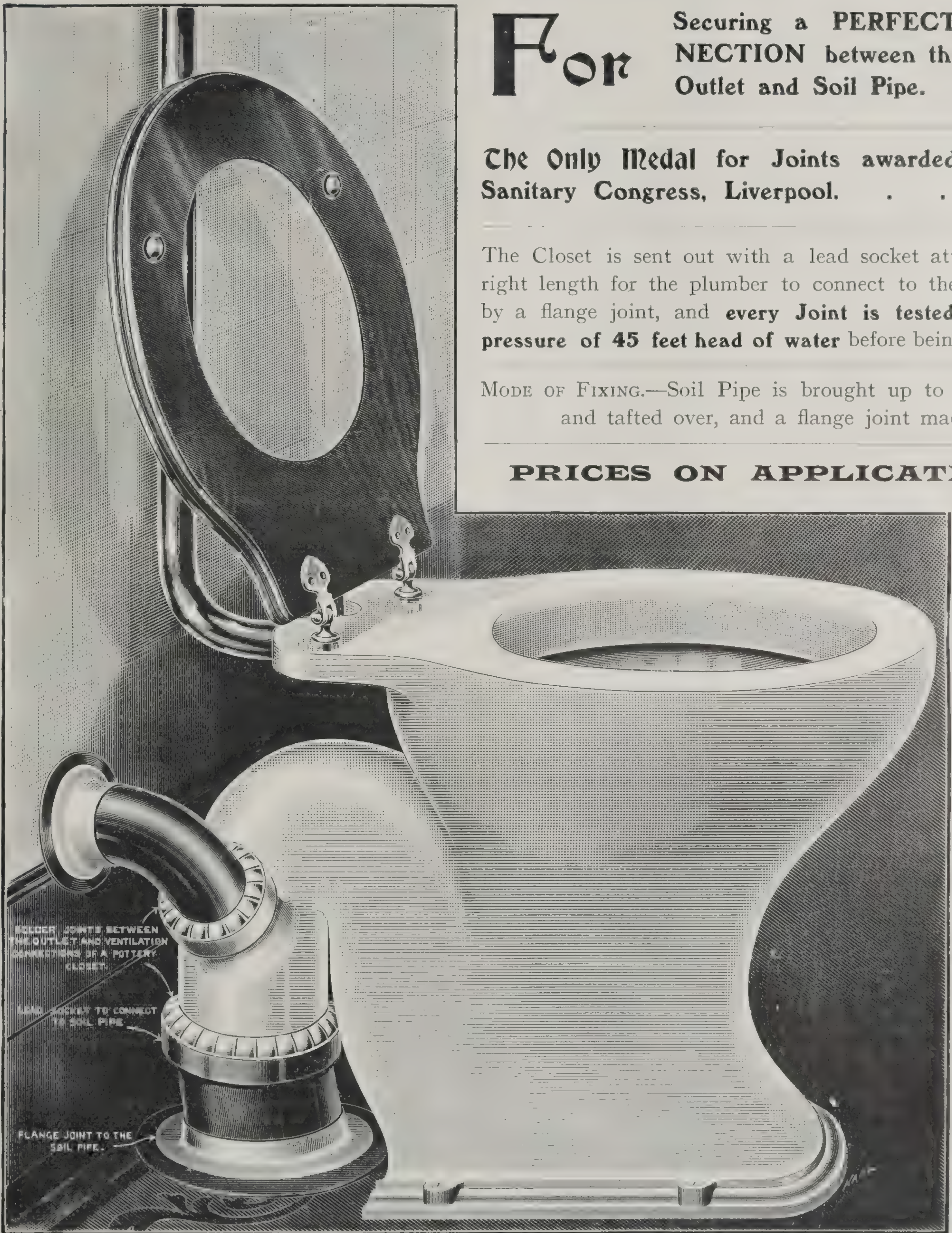
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TENDERS—*cont. from p.* xxii.

Hathersage (near Sheffield).—For the erection of five dwelling-houses and conveniences, for Mr. Samuel Ellis. Messrs. Hall & Fenton, architects, Sheffield :—

C. H. Gillam	£2,415	0	0
Malthouse & Ward	2,410	0	0
Martin & Hughes	2,266	0	0
F. Drake	2,098	0	0
E. Moore	2,095	0	0
H. White	2,090	0	0
Wilson & Kenington	2,072	0	0
J. Bertram	2,000	0	0
E. B. Dyson & Son, Heeley	1,708	12	0
J. Reed	1,500	0	0
R. Charlesworth	1,438	0	0
G. H. May & Sons, Rotherham	1,375	0	0
M. Hancock, Crookes	1,358	0	0
W. C. Mander,* Millmount Road, Meersbrook	1,458	0	0
E. A. Symonds, Hathersage (mason's work only)	994	8	6
J. H. Hodkin (joiner's work only)	490	0	0

* Accepted. [Rest of Sheffield.]

Manchester.—First contract for foundations for the Royal Infirmary. Mr. Edwin T. Hall, F.R.I.B.A., of London, and Mr. John Brooke, A.R.I.B.A., of Manchester, joint architects :—

Morrison & Sons, Liverpool	£38,475
Leslie & Co., London	37,200
P. Hodkinson, Manchester	33,800
Foster & Dicksee, Rugby, &c.	31,970
H. Lovatt, Wolverhampton	30,418
Brown & Son, Salford	27,000
C. H. Normanton & Son, Manchester	26,959
R. Neill & Sons, Manchester	26,902
Arnold & Son,* Leeds and Doncaster	26,360

* Accepted.

Middleton-in-Teesdale.—Accepted for the erection of new Wesleyan schools. Mr. T. Farrow, architect, 7, Market Place, Barnard Castle :—

All trades—William Scott, Middleton-in-Teesdale.

Sub-contractors.

Joiner and painter—J. Robson.
Plumber and glazier—A. Bell.

[All of Middleton.]

St. Albans.—Accepted for the erection of swimming-baths in Cotton Mill Lane, for the Corporation :—

J. T. Bushell, St. Albans	£1,275

Sleights (Yorks).—For the erection of a seven-roomed bungalow, for Mr. E. Anderson. Messrs. Barrett & Driver, architects, 23, York Place, Baker Street, W. :—

J. Braim & Sons	£326	10	0
W. Chapman	316	0	0
T. R. Fletcher	302	0	0
R. Harland	296	0	0
J. Hutchinson,* Sleights	241	8	6

* Accepted reduced tender, £220.

[Rest of Whitby.]

Toddington (Glos).—For the erection of a pair of six-roomed cottages and a seven-roomed single cottage and bathroom, for Mr. H. Andrews. Messrs. Barrett & Driver, architects, 23, York Place, Baker Street, W. :—

Pair of cottages.

G. Howman & Co.	£463
T. Hopkins	423
J. A. Oakey	420
Collins & Godfrey	356
Estcourt & Sons*	306

Single cottage.

J. A. Oakey	426
T. Hopkins	395
G. Howman & Co.	346
Collins & Godfrey	324
Esplay & Co., Ltd.	295
Estcourt & Sons*	274

* Accepted.

Walthamstow.—For the erection of special schools for mentally and physically defective children in Clifton Avenue, to accommodate sixty each, for the Walthamstow Education Committee. Mr. H. Prosser, architect to the committee. Quantities by Mr. G. T. G. Wright, F.S.I., 3, Great Winchester Street, E.C. :—

W. H. Hyde	£7,469	0	0
Turtle & Appleton	6,930	0	0
Martin, Wells & Co.	6,750	0	0
Kirk & Randall	6,745	0	0
Groves & Sons	6,698	0	0
H. C. Horswill	6,639	0	0
Sans & Burley	6,535	0	0
A. Faulks	6,200	0	0
F. J. Coxhead	6,100	0	0
W. J. Maddison	6,054	0	0
F. & E. Davey	5,987	0	0
Rowley Brothers	5,950	0	0
A. G. Crisp	5,886	0	0
R. & E. Evans	5,782	0	0
Knight & Son	5,776	0	0
J, & J. Dean	5,639	0	0
Pollard & Brand	5,544	0	0
W. Manders	4,949	4	10

[Referred to new Education Committee.]

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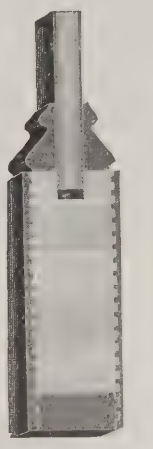

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THE

BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

May 10, 1905. Vol. 21, No. 535.

6, Great New Street, Fetter Lane, E.C.

Summary.

The R.I.B.A. suggestions for the conduct of architectural competitions have been revised. (This page.)

The Lightning Research Committee has issued its report, after four years' work. Out of 115 cases of lightning strokes, forty occurred to buildings provided with lightning rods. (This page.)

A question was asked in the House of Commons last week as to whether it was intended to clean up the façade of Buckingham Palace in connection with the Queen Victoria Memorial. Lord Balcarres, in reply, said the matter must stand over till the memorial is erected. (Page 269.)

Though the present system of triennial contracts for alterations and repairs to barracks and fortifications is not to be abolished, the War Office has decided to replace it in certain cases by the direct employment of labour. (Page 269.)

In an infectious-diseases hospital for thirty beds it is usual to provide three pavilions for the simultaneous treatment of scarlet fever, enteric and diphtheria, with perhaps a small block for doubtful cases. The provision for scarlet fever is usually greatly in preponderance over that for the other infectious diseases. The cost of a permanent hospital, efficiently equipped, will be from £300 to £450 per bed. (Page 263.)

Next autumn or next winter a committee of experts is to present another report on the ventilation of the House of Commons. (Page 269.)

Plumbing in America tends to very great complication of pipes: hence several modifications of the existing law are suggested. These modifications propose to abolish the present requirement of "back-venting" traps by a pipe extending from the sewer up to a point above the highest fixture, to omit the main house trap in the basement, to require every fixture to be constructed with an outlet large enough to fill its waste-pipe "full bore," to reduce the number of traps, to omit the trap on rain-water leaders, and to abolish the restriction of jointing cast-iron pipes with lead caulking. (Page 265.)

The London timber trade showed no improvement during April. The level of prices for Swedish and Russian deals is very low. Teak supplies are short and prices high, so that business in first-quality wood is likely to be generally restricted till next spring. (Page 262.)

There are two chief theories about colour—the Brewster theory, which gives the primaries as red, yellow and blue, and the Young-Helmholtz theory, which gives them as red, green and blue. By the admixture of the primaries other colours are produced. (Page 258.)

Competition Rules. At the annual general meeting of the Royal Institute of British Architects discussion took place on the paper on the conduct of architectural competitions as revised by the Competitions Committee, and which they propose should be issued under the title "Regulations for Architectural Competitions." After certain amendments had been passed, the meeting was adjourned to June 5th. Although several small alterations in the wording have been made in these "Regulations," they are practically the same as the "Suggestions" at present in force, except as regards the following innovations:—

(1) The particulars, conditions and suggestions are to be so drawn up as to form an agreement between the promoters of a competition and the competitors.

(2) The amount of the premium or remuneration for the competitive designs other than that placed first should be fixed under the advice of the assessor or assessors.

(3) If a deposit is required for supplying the instructions, it should not exceed the sum of one guinea.

(4) A design shall not be disqualified on the question of cost if it will probably not exceed by 10 per cent. the outlay stated in the instructions, or the estimate of the competitor should no outlay be stated.

(5) All designs, with the exception of that placed first, should be returned to their authors, carriage paid, at the close of the exhibition.

(6) Except in the case of works of inconsiderable magnitude, it is desirable that two or more assessors should be appointed.

(7) The R.I.B.A. scale of charges for assessing competitions is at the minimum rate of 30 guineas, plus $\frac{1}{5}$ per cent. upon the estimated cost of the proposed building.

At the meeting several alterations were agreed to, namely, that—

(1) If the architect were subsequently employed, the $1\frac{1}{4}$ per cent. commission previously paid should merge in his commission.

(2) The words "other than that placed first" in paragraph 2 above should be omitted.

(3) The drawings of the competitor placed first should also be returned after the exhibition.

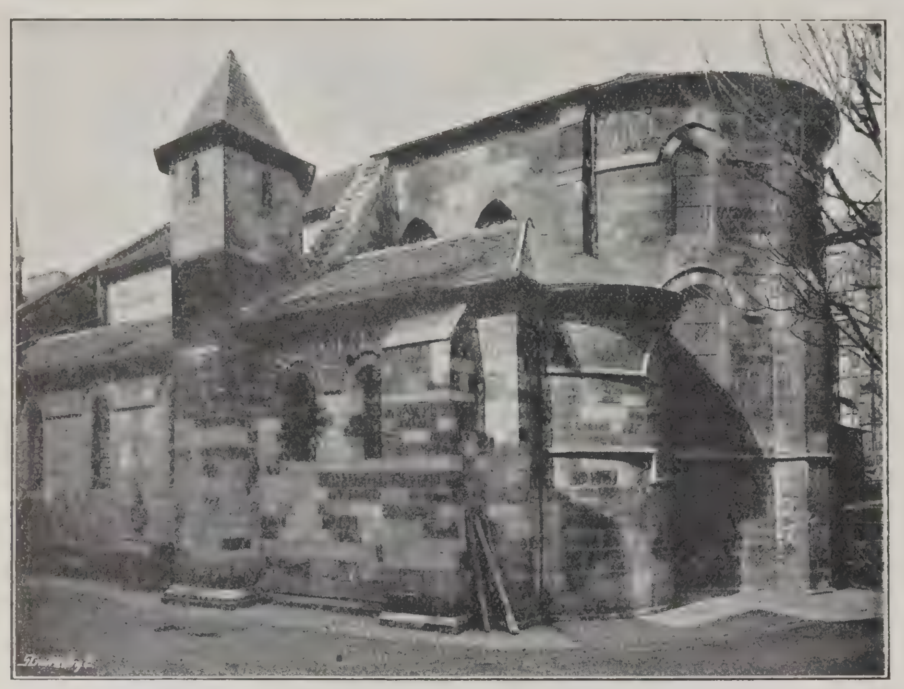
(4) In works of considerable magnitude it was desirable that three assessors should be appointed.

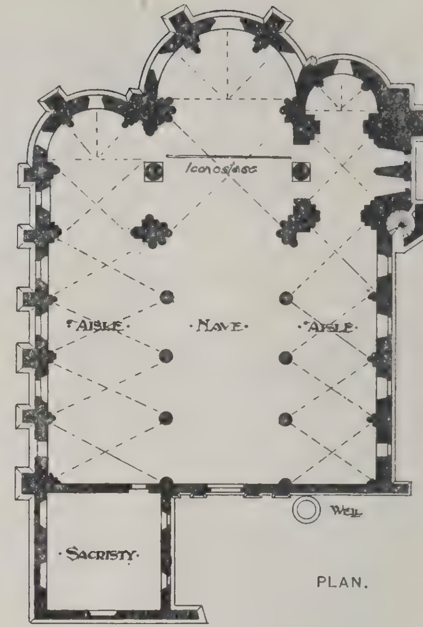
(5) A scale of charges for assessing competitions was undesirable.

The meeting was adjourned on the bone of contention that the Council should be included with the president in advising promoters in their appointment of assessors.

The regulations as amended at the meeting are on the whole commendable.

Report of the Lightning Research Committee. The report of the Lightning Research Committee is now published in the Journal of the Royal Institute of British Architects, with a preface by Sir Oliver Lodge, F.R.S. The Committee have summarized in it their four years' work, and have made suggestions and drawn up rules which are based on their observers' reports on the damage to buildings in 115 cases of lightning strokes. Forty of the buildings in question were provided with lightning rods. Sir Oliver draws attention to the two kinds of discharge likely to occur, one being of the simple type which arises when an electrically-charged cloud approaches the earth without an intermediate cloud intervening, and the other of a complex type where another cloud intervenes, the two clouds practically forming a condenser. In the first case the ordinary system of lightning conductors is efficient, but in the second case the disruptive discharge is so erratic that no series of conductors of the hitherto recognized type will suffice to protect the building. In this second case a hot column of air rising from a chimney may be preferred to a conductor. In cases where protection is considerable desirable, but heavy expense is not justified, the Committee recommend the erection of two lightning rods, on either side of spire, tower or stack, these being connected by horizontal conductors along the ridge and at or near the ground line. All metal finials, ridging, lead flashing, cowls, &c., on the roof and the rainwater drain-pipes should be metallically connected and well earthed. Copper of high conductivity increases surges and side-flash, and therefore is positively objectionable. Iron is much better. For subsidiary conductors the Committee recommend No. 4 S.W.G. It is inadvisable to connect church bells and turret clocks with the conductors. As to earthing, cinders and coke appear to have a chemical or electrolytic effect on copper and iron; hence charcoal or pulverized carbon is recommended, packed in a tubular earth. The various cases noted by the Committee show that, while even single conductors tend to diminish the damage done to buildings by lightning, no reliance can be placed on an area of protection—which view is confirmed by the latest foreign practice. No cases of damage to modern steel-frame structures have come under the notice of the Committee, but it is pointed out that the ordinary method of construction in this country does not provide full protection, for in many cases the steel columns stand on stone foundations and the metal is not carried deep enough for effective earthing: such columns ought to be earthed when erected.





PLAN.

ST. JULIEN-LE-PAUVRE, PARIS.

By F. H. CHEETHAM.

ONE of the most interesting, if least known, of the Gothic buildings of Paris is the little church of St. Julien-le-Pauvre, which stands not far from the Seine, on the left bank, immediately opposite the Ile de la Cité, in what is known as the Quartier Maubert.

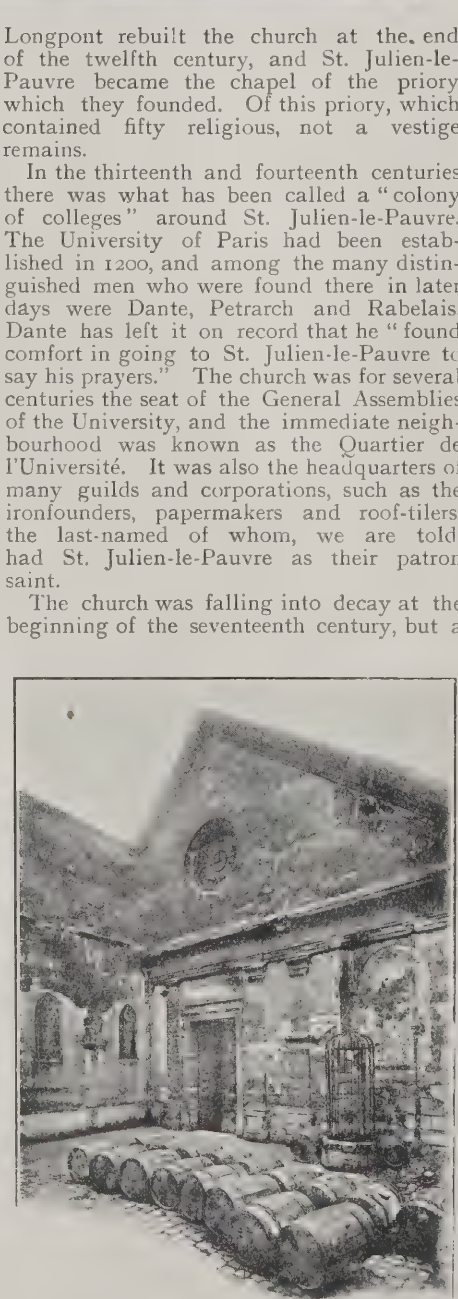
The Rue Saint-Jacques, which is a continuation of the Petit Pont and the street of that name, runs between St. Julien-le-Pauvre and the larger church of St. Séverin, so prominent an object above the roofs of the houses in the view from the towers of Notre-Dame as you look south-west. The Quartier Maubert, formerly a tortuous mass of narrow streets and culs-de-sac, has undergone many changes since the days when students from all parts of Europe congregated there intent upon the learning to be obtained in the mediæval University of Paris. Some of the old streets yet remain and more retain the ancient names. Thus we still have the Rue du Fouarre, the Rue Galande, the Rue Lagrange, and the Rue St. Julien-le-Pauvre, though the alignment of all these streets is not in every case what it was in former days.

The church of St. Julien-le-Pauvre stands at the bottom of a court which opens from the street which bears its name, a narrow street going nowhere in particular, connecting the Rue Galande with the Rue de la Bucherie. Unless the visitor to Paris goes there with deliberate intent it is unlikely that he will ever find St. Julien-le-Pauvre. The church, however, is but a stone's-throw from St. Séverin, and it is a pity that anyone visiting the larger church (itself, however, too little known) should omit at the same time to pay a visit to the smaller and less known one, even if it involve a little seeking after: the trouble is well repaid.

The history of St. Julien-le-Pauvre may be briefly recounted as follows. A church existed here as far back as the year 507, and possibly the remains of some of the ancient foundations still exist. This building was destroyed in 886 by the Normans, but we hear of the church again in 1031 or 1032, when Henri I. gave it to the Bishop of Paris. At the commencement of the twelfth century it belonged to Etienne de Vitry and Hugues de Monteler, who gave it to the Abbey of Longpont, near Monthléry. The monks of Longpont rebuilt the church at the end of the twelfth century, and St. Julien-le-Pauvre became the chapel of the priory which they founded. Of this priory, which contained fifty religious, not a vestige remains.

In the thirteenth and fourteenth centuries there was what has been called a "colony of colleges" around St. Julien-le-Pauvre. The University of Paris had been established in 1200, and among the many distinguished men who were found there in later days were Dante, Petrarch and Rabelais. Dante has left it on record that he "found comfort in going to St. Julien-le-Pauvre to say his prayers." The church was for several centuries the seat of the General Assemblies of the University, and the immediate neighbourhood was known as the Quartier de l'Université. It was also the headquarters of many guilds and corporations, such as the ironfounders, papermakers and roof-tilers, the last-named of whom, we are told, had St. Julien-le-Pauvre as their patron saint.

The church was falling into decay at the beginning of the seventeenth century, but a few years later it was put in a state of repair by the prior Pierre Méliand and his master-mason Bernard Roche, who in 1651 unfortunately pulled down the west front (which dated from the thirteenth century) and two bays of the nave, and constructed the present classic façade. Roche is also responsible for the disappearance of the bell tower and the vaulting of the nave. In 1655 St. Julien-le-Pauvre was attached to the Hotel Dieu and was used as the hospital chapel till the time of the Revolution, when it was turned into a salt depôt. A decree of Napoleon gave back the church to the Hotel Dieu, but it was not till 1826 that religious offices were once more celebrated there. From that time till 1873 St. Julien-le-Pauvre served once more as the chapel of the Hotel Dieu, and within its walls nearly all the Augustinian sisters who served the sick in the hospital (Sœurs Hospitalieres de l'Hotel Dieu) took their vows. The old Hotel Dieu, after undergoing all kinds of repairs and being condemned as too small and ill-ventilated, gave place to the existing building on the north side of the Place du Parvis-Notre-Dame. Once more St. Julien fell into desuetude, and so it remained until 1889, when, by a decree of the Minister of the Interior, it was appropriated to the use of the Greek Catholic Church (Melchites), in whose possession it now is.



THE COURTYARD FRONT, WITH OLD WELL-HEAD.

The church of St. Julien-le-Pauvre consists of a nave of four bays, north and south aisles, and choir. The aisles are of unequal width, the northern one being the same width as the nave. The nave and aisles terminate eastwards in three semicircular apses differing in size. The interior dimensions of the building are: length, 71ft.; breadth, 53ft.; height 35ft. The nave originally consisted of six bays, the two westernmost having been destroyed, as previously mentioned, in the seventeenth century when the present Doric front took the place of the Gothic facade. A portion of the old nave remains in what is now used as the sacristy, to the left on entering.

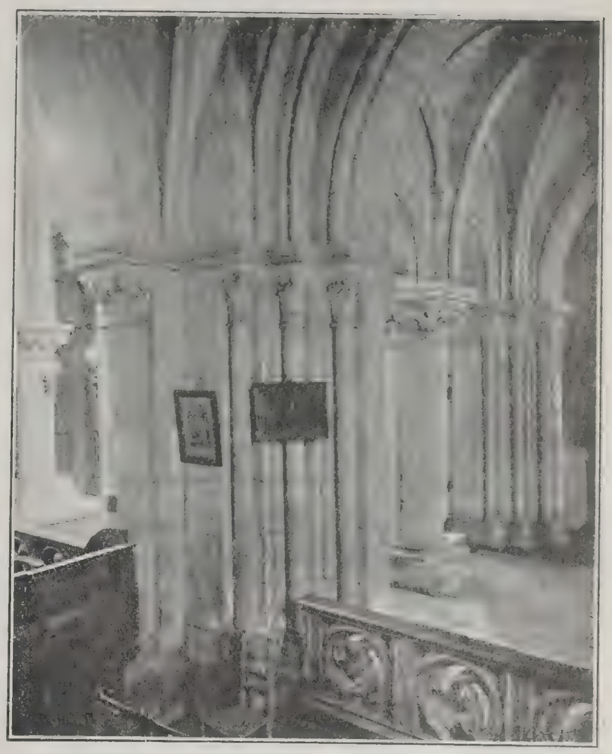
The building as a whole is a good example of the transition from Romanesque to Gothic. The body of the church, with the exception of the barrel-vault to the nave, reconstructed in the seventeenth century, is Romanesque; while the choir dates from the end of the twelfth century.

The exterior of the church presents no remarkable feature. From the court off the Rue St. Julien-le-Pauvre all that you can see is the uninteresting Doric front, with the outer wall of the sacristy to the left. Two arches of the destroyed nave are incorporated in this wall and can be distinctly seen. The pilasters of the façade are cut away in places, a reminder of the times when the building was no longer in use as a church, and when sheds and temporary buildings obstructed the court and were placed against the wall of St. Julien itself. In the courtyard, immediately to the right of the doorway as you enter the church, is a well with an iron guard. This well is supposed to be as old as the nave, and must therefore have originally stood inside the church in the south aisle. The best view of the exterior of St. Julien-le-Pauvre is from the south-east, in the open space at the back, which is approached from an entry in the Rue de la Bucherie.

Although the interior appears to be of an extreme simplicity, there is a remarkable absence of anything like symmetry, either in plan or detail. There is an ingenious variety which is at first hardly noticeable, but which becomes more and more apparent with study. The general effect of the interior is, of course, entirely marred by the presence of the iconostasis, a large screen with three openings separating the altar from the nave, made necessary by the use of the church for the Greek cult. The screen, besides striking a false note by reason of its incongruity of design, effectually blocks the view of the central apse.

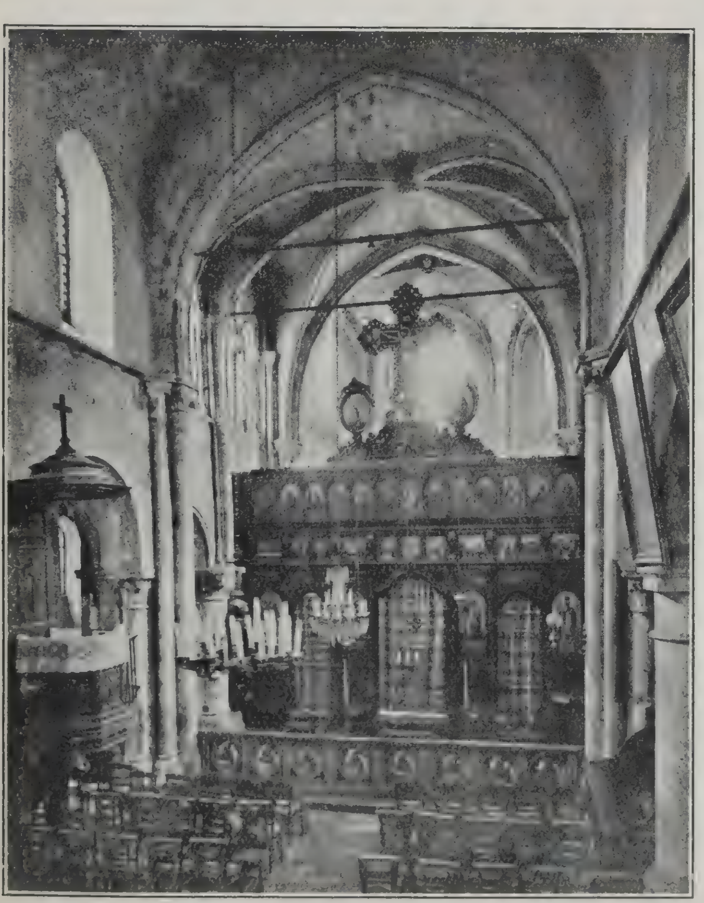
The interior, nevertheless, is not unimpressive, and a certain air of neglect—at any rate an absence of the often - too - evident presence of the restorer—rather adds than otherwise to its interest. Portions have, however, been restored, but in a conservative spirit. The building falls naturally into two parts : a short Romanesque nave with heavy round pillars and slightly stilted semicircular arches, and an early Gothic choir. The apse at the end of the north aisle contains an altar to St. Joseph, that to the south to the Virgin. At each side of the entrance to the choir is a massive irregularly-shaped pillar with slender shafts and capitals. The capitals are of excellent detail. These pillars are separated from those of the apse by a heavy circular column, recalling on a smaller scale those of Notre-Dame, and supporting a pointed arcade of two arches. The capitals of these two columns are remarkably fine, especially that on the south side. From a mass of acanthus foliage spring, at the four corners, figures having female human heads, and the bodies, claws and outspread wings of birds. The capital on the north side consists of foliage only. The sculpture of the capitals, of which there are more than 150 in this little church, is extremely good, consisting almost entirely of simple applications of the acanthus and leaves of water plants.

The screen, or iconostasis, which suggests to M. Huysmans the front of a penny theatre on the boulevards, recalls the interior decoration of Russian churches in its gaudiness of inlaid woods and painted richness. Curtains "like Cashmere shawls soaked with rain" hang before the three openings, through the central one of which the Communion is carried to the people, who must not see the altar where the mystery is accomplished. The Greek Catholics must not be confounded with the Greek Church. They acknowledge the authority of the Pope while following the Greek rite. The united Melchites, or Greek Christians of the Levant, retain the liturgies of St. Chrysostom and St. Basil, and it is this rite which obtains at St. Julien-le-Pauvre. We may regret, with M. Huysmans, this "intrusion of the Levant into the parish of St. Séverin," and think it absurd, but it is possible that but for the taking over of St. Julien by the Greek Catholics the building would have fallen on worse days.

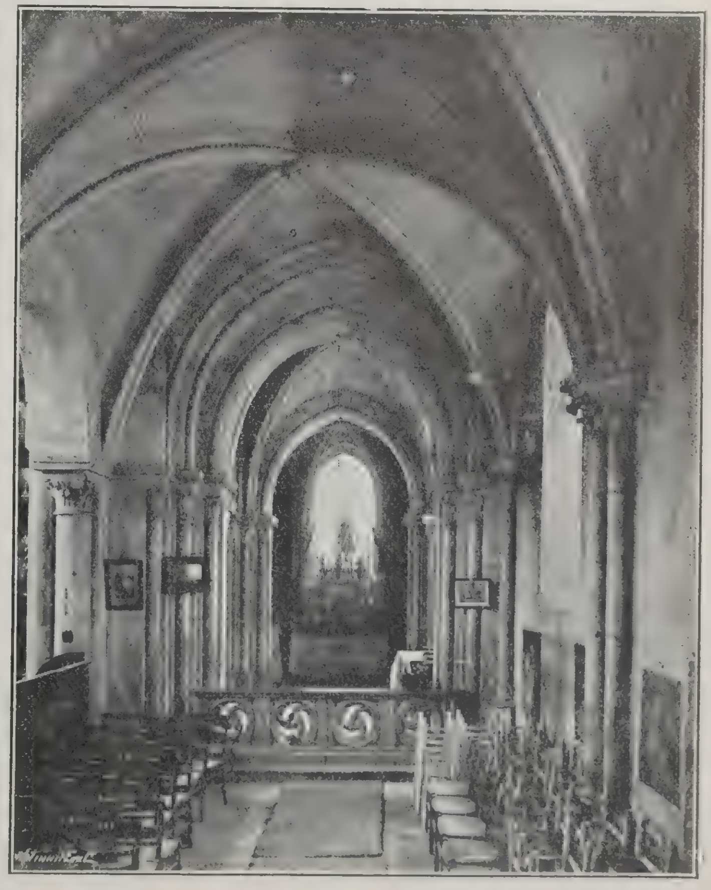

ST. JULIEN-LE-PAUVRE, PARIS.

The church contains a few monuments, but none of any artistic interest. A statue of Montyon, the founder of the Prize of Virtue, indicates his burial in St. Julien-le-Pauvre.

Mr. Hilaire Belloc, in his scholarly and fascinating book on "Paris," thus speaks of St. Julien-le-Pauvre : "St. Julien-le-Pauvre, rebuilt in the thirteenth century and altered again in the next two hundred years, is


The Iconostasis at the End of the Nave.

ST. JULIEN-LE-PAUVRE. PARIS.


Chapel of the Virgin.

curiously desolate. It should, if age and tradition could lend reverence to everything, be among the most revered of the city shrines; but the people of Paris, careful as they are of old customs, are capricious of their choice of idols and the little church is so much abandoned that foreign lovers of Paris pass it a hundred times without remembering it. This is a little due to the contrast between those old neglected streets and the new boulevards. St. Julien lies in a dark passage off the Rue du Petit-Pont; and though the demolition of some old houses lets you now see the curious triple apse from the Rue de Fouarre, it has been for centuries, and will be, I think, again covered in from its neighbourhood."

It has often been asserted that the mediæval façade of St. Julien was destroyed by fire in the eighteenth century. But such was not the case. M. Lebrun, and later M. Viatte, who have both written monographs on the church of St. Julien-le-Pauvre, conclusively show that owing to neglect and negligence the façade had become unsafe at the beginning of the seventeenth century, and in the subsequent restoration it was demolished together with the west end of the nave. The ancient façade appears to have followed the lines of the roofs of the nave and aisles, showing a large central gable with a smaller one on either side.

Baedeker devotes seven lines to the church of St. Julien-le-Pauvre, but a longer description will be found in Miss Sophia Beale's "Churches of Paris." Miss Beale's account is borrowed largely from M. Lebrun's monograph, which is, I think, now out of print. M. Viatte's monograph contains a set of measured drawings of the building, besides sketches of the monuments. Guilhermy in his "Itinéraire Archæologique de Paris" devotes four pages to the building, and gives illustrations of the interior and exterior of the choir. Lastly, M. Huysmans has devoted some twenty-four pages of his very interesting sketch of "Le Quartier Saint-Séverin" to the church of St. Julien-le-Pauvre.

PAINTS AND PAINTWORK.—II.

(Continued from p. 203, No. 532.)

COLOUR.

TO embark on an account of the many theories that have been promulgated in reference to colour is outside our present purpose, and we shall only state the view of the matter which seems to us most worthy of acceptance and helpful in the study of paints. It is possible—indeed, probable—that the present theories of colour will undergo very considerable modification, for the subject has been far too little investigated, and we are forced to make finite statements from the inability to convey in a few words the roughly-shapen form that present knowledge takes.

Colour is Light,

and the organs by which we apprehend it are the eyes. Modern theory assumes that there is a medium called the ether which conveys vibratory motion, like waves on water or in air, that strikes upon the nerves of the eye and conveys to the brain the impression of light. In all cases of wave motion there is no transference of matter from the source of the movement onwards, but simply a to-and-fro motion which is imparted from particle to particle of the medium in which the wave is advancing. This vibratory or undulatory motion of the ether has always the same velocity, but varies in rate of promulgation. Upon this vibration-frequency of the waves depends the colour, and this frequency is measured by wave-length, *i.e.*, the distance from crest to crest. Certain bodies emit their own light, such as the sun, a gas flame, an electric lamp, &c., and are known as self-luminous bodies, while others do not emit light and are therefore non-luminous. These latter, however, are rendered visible by reflecting light from luminous bodies which falls upon them. To this category paints belong.

Spectrum Colours.

White light is not a simple wave motion, but is composed of many waves of different length, and if we pass it through a triangular glass prism, in the classic experiment of Sir Isaac Newton, we bend these waves out of their course (to a greater or less extent, dependent upon their wave-length) so as to form a band of variously coloured light, called the spectrum. These are known as the spectrum colours, and range from red at one end through orange-red, orange, orange-yellow, yellow, greenish-yellow and yellowish-green, green, cyan-blue, blue, to violet at the other end. The wave length has been measured to extend from $\frac{76}{100000}$ of a millimetre at the red end to $\frac{39}{100000}$ of a millimetre at the violet end.

White and Coloured Bodies.

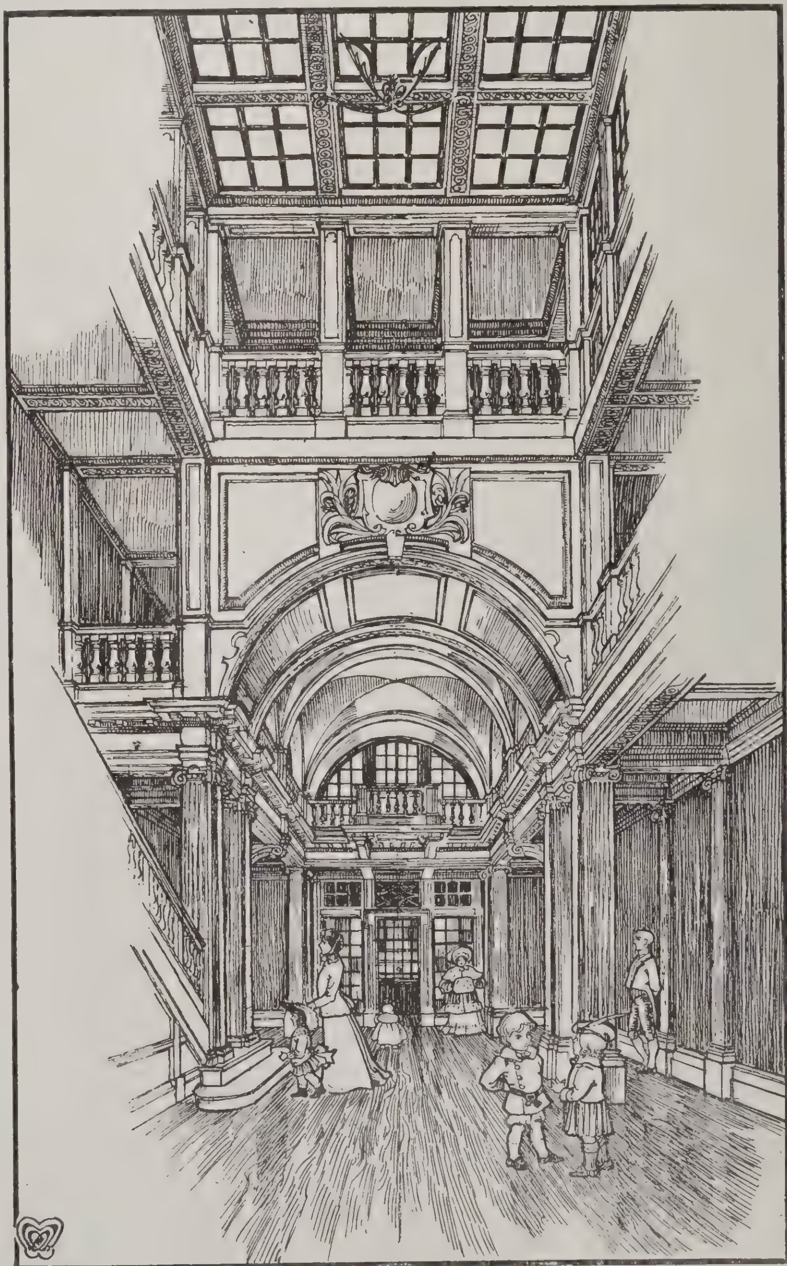
Certain bodies reflect light impinging upon them without changing the proportions of the various motions of different wave-length of which they are composed. On the other hand, other bodies absorb some of the waves and reflect back part only, and thus appear to be coloured red, green, blue or yellow, &c. Just as white light can be split up into many coloured lights, so by combination of coloured lights in proper proportion white light may be reproduced.

For the observation of colours an instrument known as the spectroscope is used: this contains a prism or prisms to resolve the entering light into its constituents, and means to observe the amount of each.

A colour has three distinguishing constants, namely, hue (denoted by the wave-lengths of its component parts), luminosity (which is its measure of brightness), and purity (measured by the proportions of lights of differing wave-lengths which compose it).

Primaries, Secondaries, Tertiaries.

Several theories have been advanced as to colour, all of which agree in this, that they formulate primary colours from the admixture of which in various proportions other



MESSRS. SPEAIGHT'S PREMISES, 157, NEW BOND STREET: THE GALLERY.
C. H. B. QUENNELL, ARCHITECT.

The entrance hall and gallery here illustrated form the reception part of the photographic premises of Messrs. Speaight. The staircase leads up to dressing-rooms at the half-landing level and again up to the studio over the gallery. Mr. H. Roffey, of Putney, was the general contractor. Messrs. Goodall, Lamb & Heighway executed the oak work to pilasters and entablature over staircase, &c., and the carving was done by Messrs. Martyn & Co., of Cheltenham. The fibrous plaster vaults, &c., were made and fixed by the Veronese Co. The design of the building was much influenced by stringent conditions of light and air and party-walls of adjoining premises.

colours can be produced. The admixture of two primaries is called a secondary and of three primaries a tertiary. The old Brewsterian theory assumed the primaries to be three—red, yellow and blue—while the newer Young-Helmholtz theory differs as to the three, stating them as red, green and blue. By the latter theory we can explain the admixture of spectrum colours and contrast of colours; whereas the older theory failed to account for such anomalies as the admixture of ultramarine with yellow ochre, producing not a green but a greenish-grey. The transmitted or reflected light from colouring matters is always compound, and to judge the effect of mixing we require to know the constituents of the light from the colouring matters. The Brewster theory is sufficient for rough and ready use in the mixing of paints, dyes, &c., but the later theory is distinctly more scientific, and unless the spectroscopic examination of colouring matters is utilized the mixing of colours cannot but be haphazard and doubtful.

The Eye.

These theories as to primaries are naturally dependent upon the physiology of the eye. The eye is unable to pick out the different constituent rays of a compound colour, and only sees it as one whole, though the sensation is doubtless built up of a number of impressions. An impression endures upon the retina for a perceptible period of time (note, for instance, the continuous line of one hue produced by a rapidly revolving wheel portions of which are painted with different colours), and this persistence of vision gives rise to many of the illusive phenomena of colour, such as after-images, contrast, &c. According to the Young-Helmholtz theory there are three sets of nerve fibres in the eye—one set sensitive to green light, another to red, and a third to blue or violet light, corresponding to the primary colours—and that when one is affected by a colour the nerves of the colour complementary to that first colour are excited to a lesser degree. Thus, when the red nerves are excited the green are also excited, though in a minor degree, and these sensations are transmitted to the brain, which is, however, unable to single out the real objective colour sensation from the subjective one, both arriving simultaneously; so that one colour only is apprehended. This means that a red must always appear yellowish (red and green producing yellow), a green more bluish and a blue more greenish than they really are. This offers an explanation of the contrast effects that occur when two colours are seen in juxtaposition, the three sets of nerves being excited so that we see neither colour as it really is or as it appears alone.

We may now investigate the two theories of colour more closely.

The Brewster Theory.

According to this theory the three primaries are:

Red. Yellow. Blue.

By the admixture of any two a secondary colour is produced. Of these there are three, thus:—

Red + yellow = orange.
Red + blue = purple.
Yellow + blue = green.

By the admixture of three primaries tertiary colours are produced, the hues of which are almost infinite. We classify them according as either or both of the primaries predominate:—

One primary predominating.	Red Tertiaries Blue ,, Yellow ,,
Two primaries predominating.	Orange Tertiaries Green ,, Violet ,,
Three primaries balancing	Citron Tertiaries Russet ,, Olive ,,
Nearly neutrals, slight predominance of either red, yellow or blue.	Brown Tertiaries Cold Grey ,, Warm Grey ,,

This theory does not account for the admixture of spectrum colours, though it applies fairly well to pigments.

The Young-Helmholtz Theory.

According to this theory there are three primary colours:

Red. Green. Blue

(Maxwell's theory only differs in taking scarlet, green and violet as the primaries.)

When two of these primary colours are mixed, secondary colours are obtained thus:—

Red + green = yellow.
Green + blue = greenish-blue.
Red + blue = purple.

Thus when colours are mixed the tint is obtained which is intermediate between them in their position in the spectrum.

When three colours are mixed white light is produced.

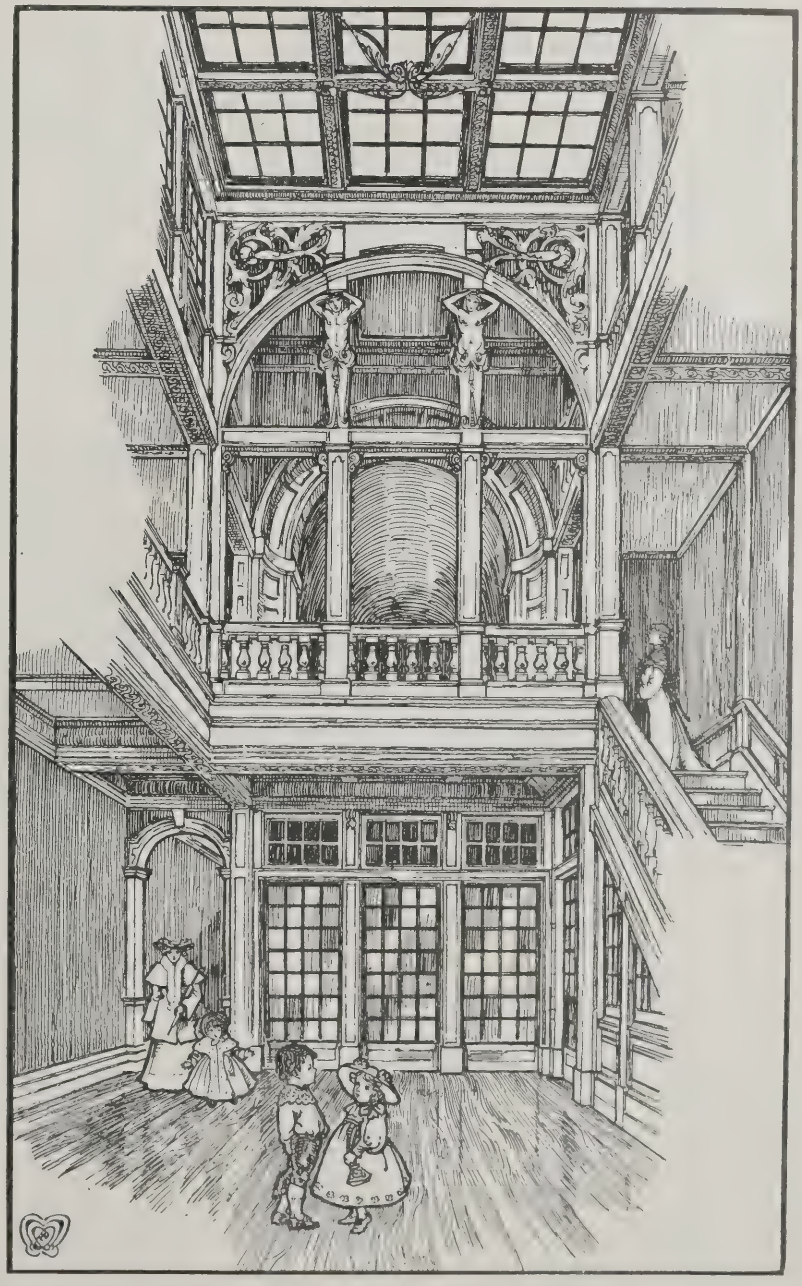
All this seems absurd compared with the actual result from admixing pigments, but it is absolutely truthful with coloured light. The theoretical explanation offered as to the effect of mixing colouring matters is as follows:—These colouring matters have an absorptive action on the light which impinges upon them and so reduce the intensity of the light. Thus a colour produced by the mixture of two or three colours will be weaker as regards its light intensity and therefore appear duller or darker, until black is reached with the total absorption of light.

Mixing of Colours.

The examination of the absorption spectra of colouring matters will give a clue to the effects produced by admixture. An absorption spectrum is found by examination of the light transmitted through a solution of a liquid or a thin film upon glass, or reflected from a pigment-surface. Various portions of the white light are permitted to pass or reflected but diminished in intensity, the measure of which can be gauged. These absorption spectra show that a blue colour, for instance, while stopping out almost all the other colours in the spectrum, may permit a small amount of red and still less green rays to pass, while another yellow colour may stop almost all the rest except for a small amount of red. The colour resulting from a combination of these two, it naturally follows, will not be a green but a reddish-toned tertiary—red being the colour common to both.

We shall deal with this subject further in future articles.

(To be continued.)



MESSRS. SPEAIGHT'S PREMISES, 157, NEW BOND STREET: ENTRANCE HALL AND STAIRCASE.
C. H. B. QUENNELL, ARCHITECT.

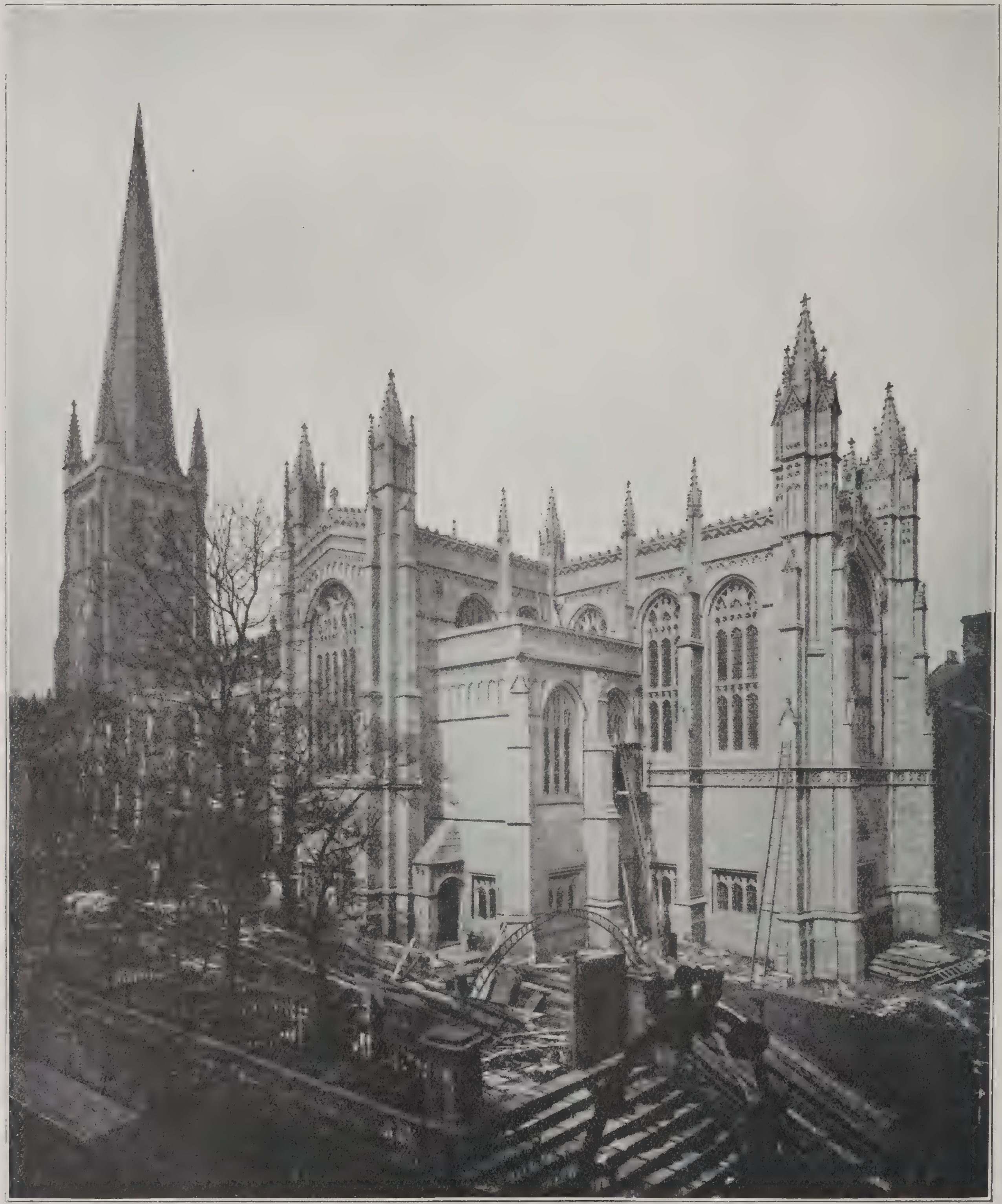


Photo: G. & J. Hall.

WAKEFIELD CATHEDRAL EXTENSION. THE LATE J. L. PEARSON, R.A., ARCHITECT.

WAKEFIELD CATHEDRAL EXTENSION.

THE extension of Wakefield Cathedral as a memorial to Dr. Walsham How, first bishop of Wakefield, who died in 1897, was consecrated and opened at the end of April. The work has cost about £50,000, and has been carried out from the designs of the late Mr. J. L. Pearson, R.A., under the direction of his son, Mr. F. L. Pearson, F.R.I.B.A., of London. The chancel of the old church has been extended eastwards about 16ft., and a retro-choir constructed, together with short north and south choir transepts and aisles. Underneath, by reason of the slope of the ground, it has been found possible to provide a chapter-house and large vestries. At the extreme east end is a morning chapel, dedicated to All Saints, 35ft. by 24ft., having a richly-groined ceiling in stone. The whole of the cathedral fittings, especially in the chancel and choir, have been overhauled and modified. New choir stalls have been provided for about sixteen extra seats; canopies, too, have been constructed. Messrs. Abbott & Smith, of Leeds, have for some time had in hand the complete renovation of the organ, which is now in a chamber which was formerly a vestry. The Walsham How memorial tomb, by Mr. R. L. Forsyth, is near the south transept window, and the children's memorial window in the south transept aisle. The marble and alabaster reredos has been designed by Mr. Oldrid Scott in conjunction with Mr. Pearson. The old sounding-board, which was in the Pilkington Chapel, has been fixed over the pulpit in the nave, and the old portion of the building, formerly fitted with gasaliers, has, like the new portion, been lighted with electricity by Mr. Taylor, of Huddersfield. The contractors were Messrs. Armitage & Hodgson, of Leeds. The extension has occupied five years, during which time Mr. W. J. Crook has acted as clerk of works.

Keystones.

Sir William Grantham's Cottages at Barcombe were certified for occupation last week.

Change of Address.—Messrs. Harris & Harris, quantity surveyors, have moved from 22, Surrey Street to 9, John Street, Adelphi, W.C.

Messrs. The Well Fire Co., Ltd., have opened new showrooms at Dover Street, Piccadilly. In noticing their exhibit at the Building Trades' Exhibition we gave their old address at York Buildings, Adelphi.

A new Book on Concrete-Steel, by Mr. W. Noble Twelvetrees, M.I.M.E., will be published shortly by Messrs. Whittaker & Co. It will deal fully with the theory and practice of reinforced-concrete construction, and will contain numerous diagrams and tables.

The Subways under the City Streets under the control of the Corporation amount to about 1½ miles. The lengths of gas, water and hydraulic mains, telegraph, telephone and pneumatic tubes and electric-lighting conduits laid in the subways under the control of the Corporation amount to 13½ miles.

Mr. W. H. Wrightson, a pupil of Mr. C. Edeson, of Scarborough, and since with Mr. A. W. West, of Maddox Street, W., Messrs. Flockton & Gibbs, of Sheffield, and Mr. Penty, of York, has entered into partnership with Mr. T. H. Baker, architect and surveyor, of London, Colchester and Clacton-on-Sea. The style of the firm is Baker & Wrightson, architects and surveyors, 21, Liverpool Street, E.C., and Clacton-on-Sea.

A Firm of Quantity and Measuring Surveyors.—In consequence of the death of the late Mr. H. T. Northcroft, the business hitherto carried on by H. T. Northcroft, Son & Neighbour and H. T. Northcroft, Son & Nicholson will in future be carried on by the three surviving parties, Mr. Henry Northcroft, Mr. W. F. Neighbour and Mr. Guy M. Nicholson, under the name of "Northcroft, Neighbour & Nicholson," at 9, Regent Street, Waterloo Place, S.W.

Hereford Cathedral West Front.—The building of the west front of the north aisle of Hereford Cathedral is progressing slowly, and it is a question whether the work will not have to be stopped for want of funds, which means that the tower at the north-west corner will not be completed. The porch, with its elaborate carving, similar in character to that on the central porch, has been finished and an oak door with iron tracery will be hung shortly. Mr. Oldrid Scott is the architect.

Queen Victoria Memorial, York.—The memorial statue of the late Queen Victoria for the city of York has now been completed by Mr. George W. Milburn, sculptor, of York, and will be placed on a pedestal in the ancient guildhall of the city. The statue, which is a seated full-size figure, is carved in Carrara marble. The block weighed about seven tons originally, and now weighs about three or four tons. The sculptor first made a full-size model in clay, which was afterwards cast in plaster, and from this model the marble was carved.

The Scheme for restoring Carisbrooke Church having been rejected by a vestry meeting because it contained a proposal to rebuild the ancient chancel, which was pulled down by Walsingham, the vicar now proposes to call a meeting for constituting a fresh restoration committee. He says that the chancel is bound to come some day, but they must leave that to the next vicar and proceed with a scheme for repairing the walls, roof and tower, removing the organ from the west to the east end, converting the tower base into vestries, opening the ancient west door, and reseating and repairing the south porch.

Great Tangley Manor House, Chilworth, near Guildford, is to be sold by public auction.

The Emerson Restaurant, Blackett Street, Newcastle, was opened last week. Mr. B. F. Simpson, F.R.I.B.A., was the architect, and Mr. W. T. Weir the contractor.

Famous Kentish Church in Danger.—Northfleet Church, one of the oldest and largest and most interesting in Kent, is in a dangerous condition, but no funds are available for the very necessary repairs.

Kingston Bridge is to be widened so as to allow trams to cross. The present bridge, which is about 100 years old, is 25ft. wide; it is to be widened by an addition of about 30ft. on the south side.

Mr. J. H. Martindale, architect, of Carlisle, has been appointed cathedral surveyor at Carlisle, in succession to the late Mr. Ormiston. The appointment of diocesan surveyor, also held by Mr. Ormiston, is in the hands of the rural deans, who have not yet filled the vacancy.

M. Rodin's Bust of Henri Becque is to be set on a column at the corner of the Boulevard de Courcelles and the Avenue de Villiers, Paris. The municipal council has decreed that there shall be no more monuments in the Champs Elysées or the Parc Monceau.

A Little Dispute.—Mr. J. Muller, architect, of Bedford Street, Strand, called recently at the office of the surveyor to the Chiswick Urban Council (Mr. John Barclay) to enquire why certain plans submitted had not been approved. The upshot was a "technical" assault on the architect, though in defence of the surveyor at Acton Police Court on Wednesday it was urged that no more force had been used than was necessary to recover plans which the architect had taken from the table. The bench imposed a fine of 10s. A cross-summons against Mr. Muller for damaging a hall-stand, which was pulled over during the dispute, was dismissed.

Gas to Replace Electricity for Lighting City Streets.—At last Thursday's meeting of the Court of Common Council a scheme was adopted for experimentally lighting Queen Victoria Street, Fleet Street and a portion of Lower Thames Street with high-pressure or incandescent gas lamps, in place of the electric light, at a cost of about £2,000. The annual saving was estimated at £400. Mr. A. C. Morton said that for street lighting electricity was an absolute failure. It had been abandoned in Vienna and Berlin, and was being gradually given up in Paris.—The Court adopted a suggestion of the London County Council to give the name of "Cheshire Court" to what has hitherto been known as Three Falcon Court, Fleet Street.

Additions to St. John's Church, Richmond.—The following particulars of the new chancel, &c., at the church of St. John the Divine, Richmond, Surrey, have been forwarded to us by the architect, Mr. Arthur Grove, of 15, Clifford's Inn, E.C., a pupil of the late John D. Sedding: "The illustration given on p. 240 of your issue for May 3rd, in connection with your notice of the Academy, is from a water-colour drawing by Mr. T. Hamilton Crawford. The alterations consist of a new chancel, chapel, organ-chamber and vestries, forming a considerable addition at the east end of this uninteresting church in the New Road, Richmond, designed by Mr. Vulliamy in 1831 and considered by some at that time to be a good specimen of church architecture. The new part is built of stock bricks and Corsham Down Bath-stone dressings on the outside, with Ham Hill stone dressings inside; and was completed in February last at a cost of £3,500. The rood with the marble pulpit and screens and other fittings have yet to be added. Outside on the east gable there is a large crucifix and figures of St. Mary and St. John modelled and carved by Mr. Richard Garbe. In the existing nave the galleries have been cut back and splayed against the north and south walls, which have been decorated with figure subjects by Mr. N. H. J. Westlake. The old glazing has been replaced by new with Prior's glass in various colours and patterns executed by Messrs. Britten & Gilson. The electric light has been installed by Messrs. Wenham & Waters, with fittings designed and executed by Messrs. Bainbridge Reynolds, Ltd. The heating has been carried out by Mr. J. Jeffrey. The general contractors were Messrs J. Dorey & Co, of Brentford."

Builders' Notes.

Messrs. Doulton & Co., Ltd., have been selected to supply the sanitary fittings for the new Ritz Hotel, Piccadilly.

Cardiff Building Trade Dispute Settled.—The committee of the Cardiff Master-Builders' Association have met the representatives of the various trades, and an amicable agreement has been arrived at, the masters withdrawing the demand for an alteration in the winter working hours.

Dublin Building Trade Dispute.—At a meeting of the Dublin Trades Council held last week a resolution was adopted asking the masters to submit to arbitration the cause of dispute—the refusal of the bricklayers' society to accept the employers' demands concerning piecework.

Berlin Building Trades.—May Day was celebrated in Berlin by between 30,000 and 40,000 workmen connected with the building trades. Meetings were held and resolutions were passed expressing confidence in trade-unionism as the only means of securing for workmen the social reforms for which they are striving.

The "Ellkay" Patent Bath Syndicates have amalgamated their businesses with that of Messrs. Cornes & Haighton, of Leek, Staffs., under the title of Ellkay & Cornes, Ltd., with a capital of £80,000. The new company have retained the services of Mr. James Cornes, who will be chairman of the board of directors, and Mr. E. W. Lancaster, the patentee of the "Ellkay" bath, who will jointly manage the business.

Newcastle Building Trades Dispute.—In accordance with resolutions passed by their various societies, the masons, bricklayers, plasterers and builders' labourers on April 29th struck work against the demand of their employers for a reduction of wages and certain alterations in the conditions of work. It is too early to estimate the number of men actually affected, or what the result will be upon the building trade of Newcastle and district, but the men maintain that the numbers leaving work are so considerable as to seriously delay the completion of important contracts.

Scottish Building Trades Federation.—The half-yearly meeting of the executive was held in Inverness last week, Mr. William Macdonald, president, in the chair. The trades disputes in Glasgow, Edinburgh and Aberdeen were considered, and it was reported that the dispute between the operatives and master-joiners in Aberdeen had been settled, the employers' terms having been accepted. It was also reported that the Edinburgh bricklayers' dispute had been settled on terms satisfactory to the employers. The state of trade throughout the country was dull. It was resolved that uniform dates for the renewal of by-laws affecting operatives should be adopted throughout the country. The Edinburgh and Aberdeen delegates suggested June 1st annually as a suitable date, but it was ultimately agreed that the fixing of dates should be left to each separate trade, uniformity for each branch of the building trade being all that was desired.

THE TIMBER TRADE.

London Market in April.

DURING April there has been no improvement in the London timber market. Messrs. Churchill & Sim state that the deliveries from the docks have fallen off another 3,600 standards in comparison with April 1904, the two weeks affected by the Easter Holidays both falling in April in each year.

The total deficiency for the first third of the year, as compared with the same period of 1904, amounts now to nearly 10,000 standards, and sadly belies the hopes of better trade to come which were indulged in and acted upon at Christmas time. Messrs. Denny, Mott & Dickson, however, state that on the whole there has been no reason for any weakening of the general impression that business is gradually, if in some branches of the trade almost imperceptibly, improving. The lack of demand shows in the figures of the dock stock, which is not reducing so quickly as it should do, and is also slightly reflected in the course of prices during the month, which are weaker than they were in March last. These have been still more affected by the reductions made by Swedish selling agents during the month for fresh supplies for arrival. So far as can be judged from the ships chartered, very little preparation has been made to bring any of these supplies to London early, and this market will have very little selling pressure to withstand for the present.

The abstract of stock, consumption, &c., for April, published by Messrs. Foy, Morgan & Co., is given in the table at the foot of this page.

Dock Stock.

The stock of wood in the public docks on April 30th was:—

	Pieces.
Foreign deals and ends - - -	974,000
Do battens - - - -	1,740,000
Pine deals and battens - - -	998,000
Spruce do. do. - - -	750,000
Boards, rough - - - -	2,770,000
Do. prepared - - -	3,369,000

Totalling 13,601,000 pieces, as compared with 15,457,000 in 1904, 14,591,000 in 1903, and 15,432,000 in 1902.

In other kinds the stock was as follows:—

Foreign wainscot logs - -	192 pieces.
Do oak timber - - -	779 loads.
Do. fir timber - - -	561 do.
Do. Oregon pine, &c., spars and masts - -	4,343 do.
Colonial oak timber - - -	1,368 loads.
Do. birch timber and planks -	1,567 do.
Do. elm and ash timber -	634 do.
Do. yellow pine - - -	379 do.
Do. red pine - - -	243 do.
United States pitch-pine timber -	17,048 do.
Do. do. deals -	61,000 pieces.
East India teak - - -	7,017 loads.

Deliveries during January, February, March and April.

The deliveries for the first four months have been:—

	Pieces.
Foreign deals and ends - - -	1,111,000
Do. battens - - - -	2,036,000
Pine deals and battens - - -	375,000
Spruce do. do. - - -	530,000
Boards, rough - - - -	2,150,000
Do. prepared - - -	4,975,000

Totalling 11,177,000 pieces, as compared with 12,615,000 in 1904, 13,502,000 in 1903, and 13,885,000 in 1902.

The deliveries for April

have been as follows:—

	Pieces.
Foreign deals and ends - - -	250,000
Do. battens - - - -	473,000
Pine deals and battens - - -	120,000
Spruce do do - - -	118,000
Boards, rough - - - -	391,000
Do. prepared - - -	1,281,000

Totalling 2,633,000 pieces, as compared with 3,181,000 in 1904, 2,948,000 in 1903, and 3,619,000 in 1902.

Deliveries from Ship to Craft

For the first four months of the year the deliveries direct from ship to craft have been:—

	1905. P.s.h.	1904. P.s.h.	1903. P.s.h.	1902. P.s.h.
Deals and battens -	8,118	7,657	8,297	6,347
Boards - -	3,764	3,265	4,345	5,386
Total -	11,882	10,922	12,642	11,733

and for April—

	P.s.h.	P.s.h.	P.s.h.	P.s.h.
Deals and battens	2,947	2,852	3,704	1,093
Boards - -	1,461	1,841	1,947	1,832
Total -	4,408	4,693	5,651	2,925

Soft Woods.

Swedish Wood.—Messrs. Churchill & Sim state that the course of the market for Swedish wood in London has been downwards in April. The level of prices is so low that there has been no room for any pronounced fall, but there has been no support from any active demand, and the further concession made for fresh stocks for arrival has been the reverse of encouraging, so that quotations both for deals and battens are now rather under those current here in March. Deals have held their own on the whole better than battens; the latter had not fallen much here so far, and have now only weakened in sympathy with other sizes. Prepared boards have been steady throughout the month, and there is no change to report in them since March.

Norwegian Boards.—The importation of prepared boards from the Norwegian ports in April has been less than half that of April last year. Prices have remained quite steady, and without change from those current here in March.

Russian Deals.—There is little change to report for April. Prices for deals are a point down if anything, in consequence of a weak demand and a belief that still further reductions would be faced by shippers to secure contracts for clearance quantities for arrival.

Finnish Battens.—The market for Finnish battens in London has been a weak one during April. There is small justification for this in the prospects ahead, but the lack of demand is telling severely against this class of stock especially.

Prussian Timber.—A small arrival of fir timber in April has made no difference to the London market, which remains without change from the quotations of the previous month. For foreign oak the London market has advanced a point in April, and there seem to be many causes operating in this direction, but the demand is so small that it takes much time for a reduced supply to have any effect.

Canadian Timber.—Pine deals are the only things for which the demand has shown some improvement in April, and this is probably only the reflex of freer selling here at vastly reduced prices. For spruce the arrivals from the lower ports are on a very small scale, and quotations for shipment continue firm at a prohibitive level so far as London is concerned. The market here is nevertheless very dull, and prices are a point down since March. Oak, birch and yellow-pine timber have been held for rather better prices than of late, in obedience to the prospects ahead. The few logs of elm and ash that have been sold have only found a market at reduced rates.

For sawn timber the market has been disappointing in April. The deliveries have improved, and the cost of further shipments is much enhanced, but in London certainly the market sales have been at lower rates than in March, although the quantities sold have been small. Probably there is much contract work going on concurrently with this. Pitch-pine deals arrived here with some freedom during April, and the market has weakened under the pressure.

Teak.—Messrs. Denny, Mott & Dickson report that the landings in the docks in London during April consisted of 85 loads of logs and 235 loads of planks and scantlings, or a total of 320 loads, as against 584 loads for the corresponding month of last year. The deliveries into consumption were 563 loads of logs and 361 loads of planks and scantlings—together 924 loads, as against 555 loads for April, 1904.

These figures are significant in respect to the continuous depletion of stocks and the very inadequate arrivals from India. It must be noted, however, that a Moulmein cargo of about 850 loads has come to hand, but not having completed discharge is not included in the stock of 3,922 loads of logs. The cargo consists entirely of short logs, but even these will be a very welcome contribution to the unwholesomely bare stocks—although the fact of a whole cargo being composed of short logs only is a further proof of the inability of the shippers to meet the requirements of the home market. Prices are already sufficiently high to have brought out all possible reserves at the shipping ports, and merchants and consumers have to accept the fact that the limited supplies of teak for the present year will greatly restrict, if not altogether strangle, business in first-class teak until the spring of 1906

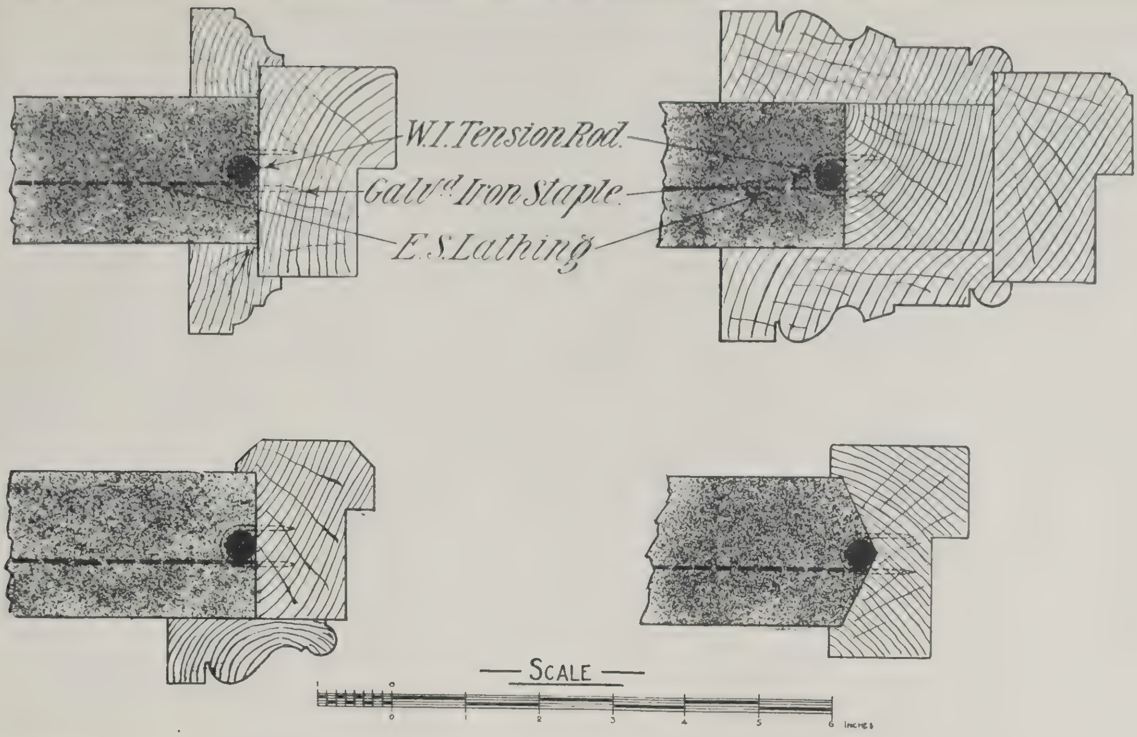
Mahogany.—The import has been light, and the consumption, though moderate, has been sufficient for the supply. There has, therefore, been little desire to press wood for sale, although small and inferior timber hangs somewhat heavily on hand. Prices on the whole have been well maintained, with little or no variation.

Odessa Oak.—The demand for logs has continued unchecked, and shippers are still able to meet the same; but the recent burning down of the chief producing mill has for a time put a stop to business in flooring and other conversions.

Oregon Pine.—The demand has been moderate, but prices are well maintained, as the strength of the pitch-pine market has a reflex action on this wood, which comes into competition when exceptional lengths and sizes are required for constructive work.

Abstract of Stock, Consumption, &c., for April.

S.C. Dks. and M. Dks.	Deals (Fir).	Battens (Fir).	Pine.	Spruce.	Pitch-pine Deals.	Deals and Battens in Aggregate.	Rough Boards (All Countries).	Flooring.	Floated Timber.
	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Loads.
Public dock stock - - -	818,647	1,834,091	998,116	750,059	60,895	4,461,808	2,770,204	6,368,428	22,500
Monthly public dock consumption - - - - - -	213,073	502,980	114,023	131,935	6,330	968,341	413,194	1,228,081	3,012
Overside stock - - - - -	—	—	—	—	—	—	—	—	—
Overside consumption (averaging of dock):—									
82 per cent. Sawn 55 ,, Planed	174,720	412,444	93,499	108,187	—	788,850	338,819	675,445	—
Duration of supply at same rate of consumption - - -	2·11 months.	2·00 months.	4·81 months.	3·12 months.	9·62 months.	2·54 months.	3·68 months.	3·35 months.	7·47 months.



FRAMING FOR DOOR-OPENINGS WITH EXPANDED METAL.

USES OF EXPANDED METAL.

On this page we illustrate two applications of expanded steel which will be of interest to architects and builders.

Fig. 1 shows some details for framing door-openings for solid partitions, walls, &c. Vertical wrought-iron tension rods are fixed 12ft. apart at top and bottom, to which the expanded metal lathing is fixed with galvanized soft iron wire, and where the openings occur the framing is fixed to the vertical rods with staples, as well as being dowelled or spiked to the flooring and stapled to the lathing over the door-head.

Fig. 2 shows a method of trimming around well-openings in flooring. It will be seen that steel channels are used, and all rivets countersunk in the face of the well to obtain a flush finish. The well-openings in expanded steel and the concrete flooring at Messrs. Armstrong, Whitworth & Co.'s works at Elswick were constructed in this manner.

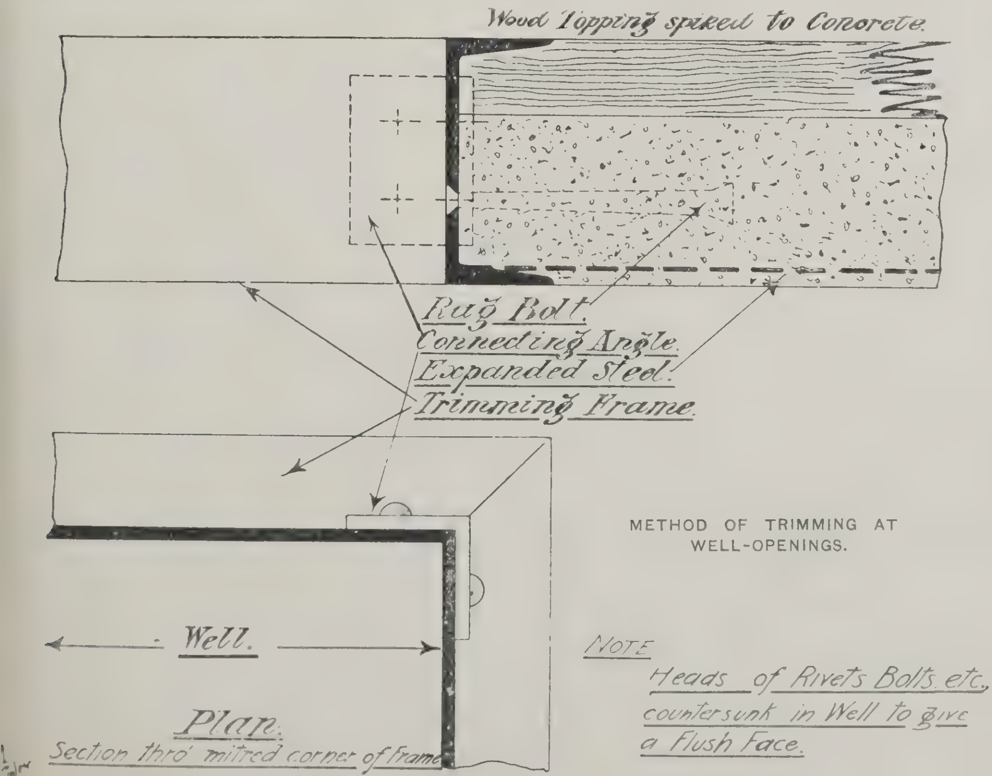
Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Book on Essex Churches.

In answer to "X" (see p. 253 of our issue for last week) Mr. W. Arthur Webb, A.R.I.B.A., writes: "This month will be published a book on 'Mediæval Architecture in Essex,' written by Mr. Ernest Godman, the secretary of the Memorials of Greater London, with fifty illustrations (photographs and line drawings), the letterpress portion being the work of the Essex House Press. The price will be 12s. Mr. Godman's address is Sunnyside, Banstead, Surrey."


Wood Topping spiked to Concrete.
Rag Bolt.
Connecting Angle.
Expanded Steel.
Trimming Frame.
Well.
Plan.
Section thro' mitred corner of frame
Note
Heads of Rivets Bolts etc, countersunk in Well to give a Flush Face.

METHOD OF TRIMMING AT WELL-OPENINGS.

Isolation Hospitals.

In reference to the enquiry under this head on p. 253 of our issue for last week, G. B. (Hythe) writes: "The Local Government Board issues a pamphlet under the heading 'On the provision of Isolation Hospital Accommodation by Local Authorities' (Eyre & Spottiswoode, 1d). This contains typical sketch plans of miniature hospitals of this class, rules as to the minimum floor and cubic space allowed for each patient, and hints as to the mutual isolation of the drainage systems from the various blocks of buildings. The primary objects of the provision of this class of hospital being the isolation of patients from the public and from patients suffering from other infectious diseases, it is obvious that widely separated pavilions should be provided for each disease under treatment. In the course of a long experience and special study of this class of building I have never met with a case in which specific provision has to be made for the treatment of 'six or seven different diseases.' In a hospital of the size mentioned by the querist (thirty beds), it is usual to provide three pavilions for the simultaneous treatment of scarlet fever, enteric and diphtheria respectively, with perhaps a small block for one or two patients of each sex for cases of doubtful diagnosis. The provision for scarlet fever is usually greatly in preponderance over that for other infectious diseases, and accommodation must of course be based upon and proportioned to the relative frequency of cases as reported to the medical officer of health, whose returns are usually available for public inspection. Where the number of patients justifies such an arrangement, it is now considered desirable to provide, in connection with the main wards, small wards for each sex for moribund, acute, septic and doubtful cases respectively, and care should be taken in planning to see that the patients are, as far as possible, under the immediate surveillance of the nurse in charge. With regard to the cost, it is not possible to provide a permanent hospital, with proper adjuncts and with any pretence to efficiency, for a less sum than from £300 to £450 per bed, according to the prices of local labour and materials, so that the sum mentioned by the querist (£4,000 for thirty beds) is totally inadequate."

C. E. writes: "Querist can get a block plan of isolation hospital from the Local

Government Board for 6d., and other information on application. The Local Government Board will not have several diseases treated under one roof, and insist on their rules being complied with. The medical officer of health or the surveyor of the district concerned would probably be glad to give all necessary information."

R.I.B.A. NOMINATIONS.

THE following have been nominated as vice-presidents and members of council for the ensuing year of the Royal Institute of British Architects:—

Vice-Presidents.

Edwin T. Hall
Sir John Taylor

Members of Council.

Maurice B. Adams
R. Stephen Ayling
Frank Baggallay
John Bilson
J. J. Burnet
W. D. Caröe
A. W. S. Cross
Herbert Davis
E. M. Gibbs
J. Alfred Gotch
E. A. Gruning
G. Hubbard
E. W. Mountford
A. N. Prentice
G. H. Fellowes Prynne
C. Harrison Townsend
Paul Waterhouse

Associate Members of Council.

W. A. Forsyth
T. E. Pryce
E. A. Young.

OUR PLATE.

THE village at Sandon forms part of a scheme which is now being carried out to the designs of Mr. E. Guy Dawber, F.R.I.B.A. The village club, with reading- and billiard-rooms and gymnasium, &c., is already built opposite the new buildings shown in our centre plate, and the entrance lodges and gates to the park were done two or three years ago. The village is not new; it contains some old houses, &c.; but this particular portion at the junction of two roads is going to be formed into a green with more new buildings around it. The present "Dog and Doublet" will be pulled down and a new one built as shown. Oak grown on the estate, with local stone and rough-cast, will be used. The drawing is exhibited at the Academy.

Correspondence.

Baryta Treatment of Stonework.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—In noticing our exhibit at the Building Trades' Exhibition, on p. 246 of your issue for last week, you state in reference to the baryta treatment of stonework that "the soluble sulphate of lime . . . . is converted . . . . into soluble sulphate of baryta": whereas the reverse is the fact, the lime being converted into insoluble sulphate of baryta. It is the fact of turning a soluble salt, such as sulphate of lime, into an insoluble salt, such as sulphate of baryta, which stops the decaying process, by preventing the sulphate of lime decomposing and crumbling away.—Yours truly,

JULIUS HÜLSEN & Co.

NEWCASTLE-ON-TYNE.

[Our statement of the chemical changes effected by the baryta treatment was based on the printed instructions of Professor Church, dated December 7th, 1904, as furnished to us by you, and the words quoted are as they appear in these instructions. The error is of course due to a misprint.—ED. B.J.]

Are Lightning Conductors Dangerous?

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Permit me to point out that the article in the "Electrical Review" to which you refer appears to have been based on the mistaken idea that, as a large proportion of the cases under consideration by the Lightning Research Committee had lightning conductors, more protected than unprotected buildings were damaged by lightning. The writer overlooked the fact that, whereas in the first year of their existence the Committee received reports of about one-sixth of the cases of damage that occurred, in the succeeding years they received a very small proportion because they intimated that only accounts of damage to protected buildings were desired.

From a close investigation of the subject extending over seventeen years I have found that from 300 to 400 buildings are damaged by lightning in this country every year, out of which fewer than a dozen were fitted with conductors. Most of these had been in use for from twenty to sixty years, and had mostly been applied by men whose calling did not imply that they were experts in this admittedly complex subject!

It would be absurd to hazard a guess as to the number of lightning flashes that occur in this country annually. It is sufficient to say that it must be enormous. Now, as the loftiest buildings are obviously somewhat more liable to be struck than low ones, and as the majority of the former are fitted with conductors, one would expect a very large number of failures if conductors, instead of being safeguards, were a source of added danger.

If a case of failure occurs it is fully advertised, but when lightning conductors are struck by lightning and no damage results nothing is said about the matter—in fact, even the inmates of the building are not generally aware that the conductor has averted a disaster. There are unmistakable signs by which one can tell that a conductor has been struck by lightning, and when testing conductors one of the first things I do is to see whether Nature has been testing the conductor before me. It is quite a common occurrence to come across these signs. I have in my possession three examples, and might have collected a great quantity but that the owners generally prefer to keep them as curiosities, or say that as they have answered so well they will not have them disturbed.

If the Committee had asked for particulars of such cases I venture to say that they would have received a much more formidable list than the one they have of failures, and that a field of investigation would have been opened that would have produced most interesting and valuable results.

Lightning conductors have been employed for the protection of buildings for over a century and a half, and the adoption of them has been increasing year by year—this in spite of the strongest opposition by fanatics, cranks and those whose limited knowledge or want of knowledge of the subject has led them to form erroneous views as to what a conductor is and what it is intended for; and their use would not have increased in this way if they had been harmful or even useless.—Yours truly,

ALFRED HANDS, F.R.M.S.

LONDON.

Manchester Town Hall.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—In your issue for April 26th, referring to the proposed county hall for London, you give the cost of the town halls in five large cities, heading the list with Manchester Town Hall, the cost of which you put at £1,050,000. I should like to know what is your authority for this figure, as I have reason to believe that the cost of the building—exclusive, of course, of furniture—was £495,950. It is possible that your larger figure includes the value of the site.—Yours truly,

PAUL WATERHOUSE.

[Our authority for the figure stated was the "Daily Chronicle." The £1,050,000, we take it, includes everything—site, building and equipment: though, making ample allowance, it certainly seems extravagant. The cost of the Westminster Bridge site for the proposed county hall is put at £600,000, with £44,000 for making the embankment, as against £1,056,000 for the building.—ED. B.J.]

Competitions.

Public Library, Hamilton.—The architect of this building is Mr. Alexander Cullen, F.R.I.B.A., selected in competition.

Elementary School, Aylesbury.—1st, Messrs. J. Moir Kennard & H. Kennard; 2nd, Mr. A. Hendry and Messrs. John Cash & M. S. Hack (divided).

New School, Taunton.—This competition has been decided as follows:—1st, Messrs. H. Dare Bryan (Weston) and F. W. Roberts (Taunton); 2nd, Messrs. Samson & Cottam, Taunton and Bridgwater; 3rd, Messrs. Price & Jane, Weston-super-Mare.

Laboratories at Aberystwyth University College.—In limited competition Mr. A. W. S. Cross, F.R.I.B.A., has been selected architect for the Davies memorial laboratories to be erected at the University College of Wales, Aberystwyth, at a cost of about £20,000.

Schools, Wolverton.—The competition for a new elementary school at Wolverton has been decided as follows:—1st, Messrs. Harrington, Ley & Kirkham; 2nd, Mr. Frank T. Bagallay. Messrs. Harrington, Ley & Kirkham were also awarded the first premium in the competition for a new secondary school at Wolverton, and Mr. G. Sedger the second premium. Mr. T. W. Cutler, F.R.I.B.A., was the assessor.

Stockport Sunday School Centenary Memorial Hall, &c.—The fifteen competitive designs submitted in this competition were exhibited last week at Stockport. The scheme is to cost £15,000. Accommodation is provided for 3,000 persons, with twenty-four classrooms. The design of Messrs. Potts, Son & Hennings has been placed first by the assessor, Mr. A. Murgatroyd, of Manchester.

Competition for Housing Scheme, Norwich.—The committee of the Competition Reform Society disapprove of the conditions in this competition because the information to competitors is insufficient, there is no independent assessor, and the committee reserve the right to use any of the plans submitted, whether successful or not, without payment, and do not bind themselves to carry out the successful or any other design. Architects are requested to abstain from competing unless the conditions are satisfactorily revised.

Obituary.

Mr. Walter Aston, F.R.I.B.A., of Macclesfield, left gross estate valued at £5,429.

Councillor John Wright, head of one of the largest building and contracting concerns in Nottingham and district, died recently, aged 65.

Mr. W. G. Scott, head of the firm of Messrs. W. G. Scott & Co., architects and surveyors, Workington, died recently, aged 67.

The late Mr. William Sturge, an ex-president of the Surveyors' Institution, who died on March 26th last, left estate which has been valued at £155,256.

Mr. T. P. Worthington, engineer and architect, Blackpool, died last week, aged 64. He was engineer to the Victoria Pier, Blackpool, and honorary architect to the Blackpool Victoria Hospital. He acted as engineer to the central pier extensions and designed many residences in Blackpool and the surrounding district.

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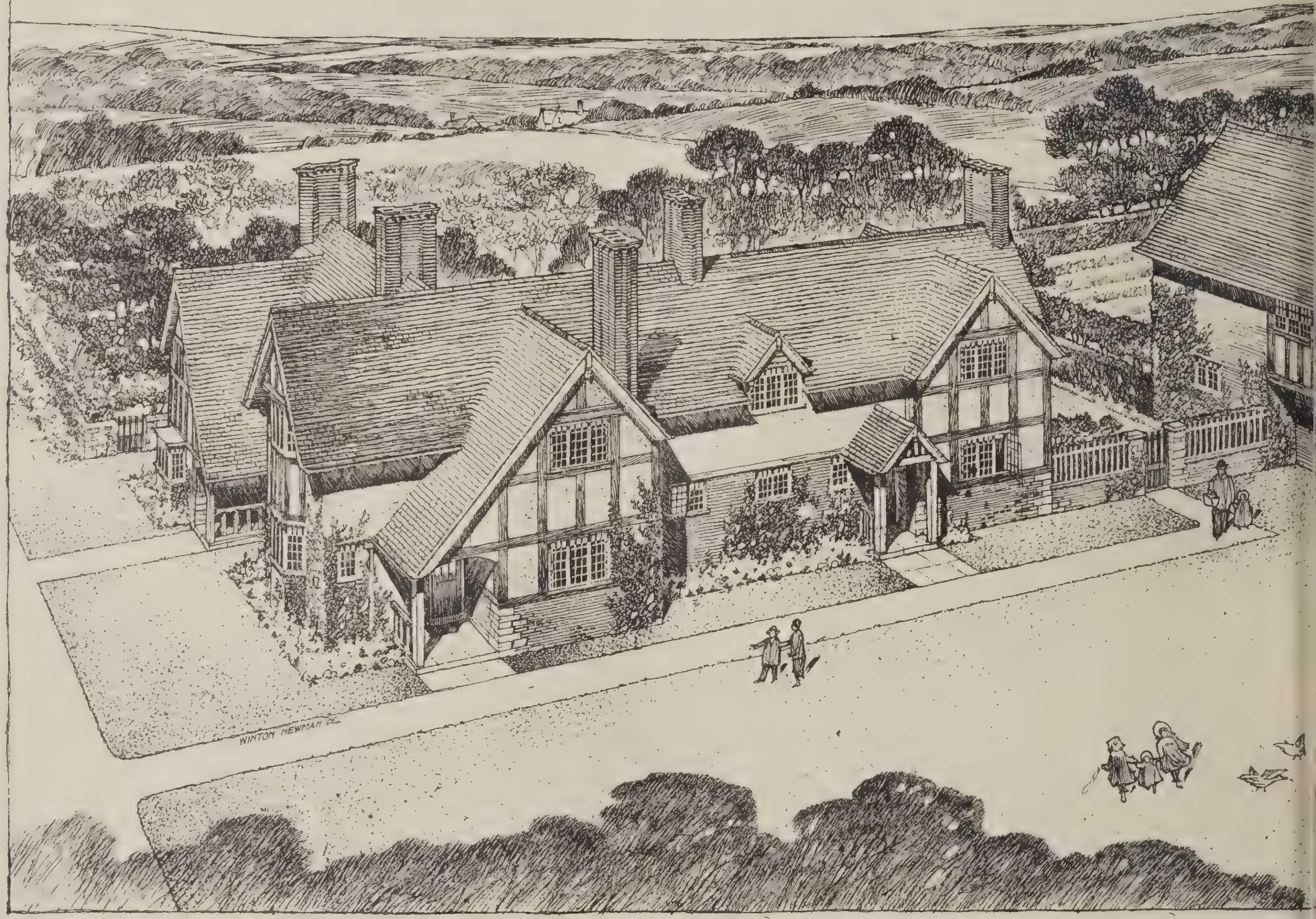
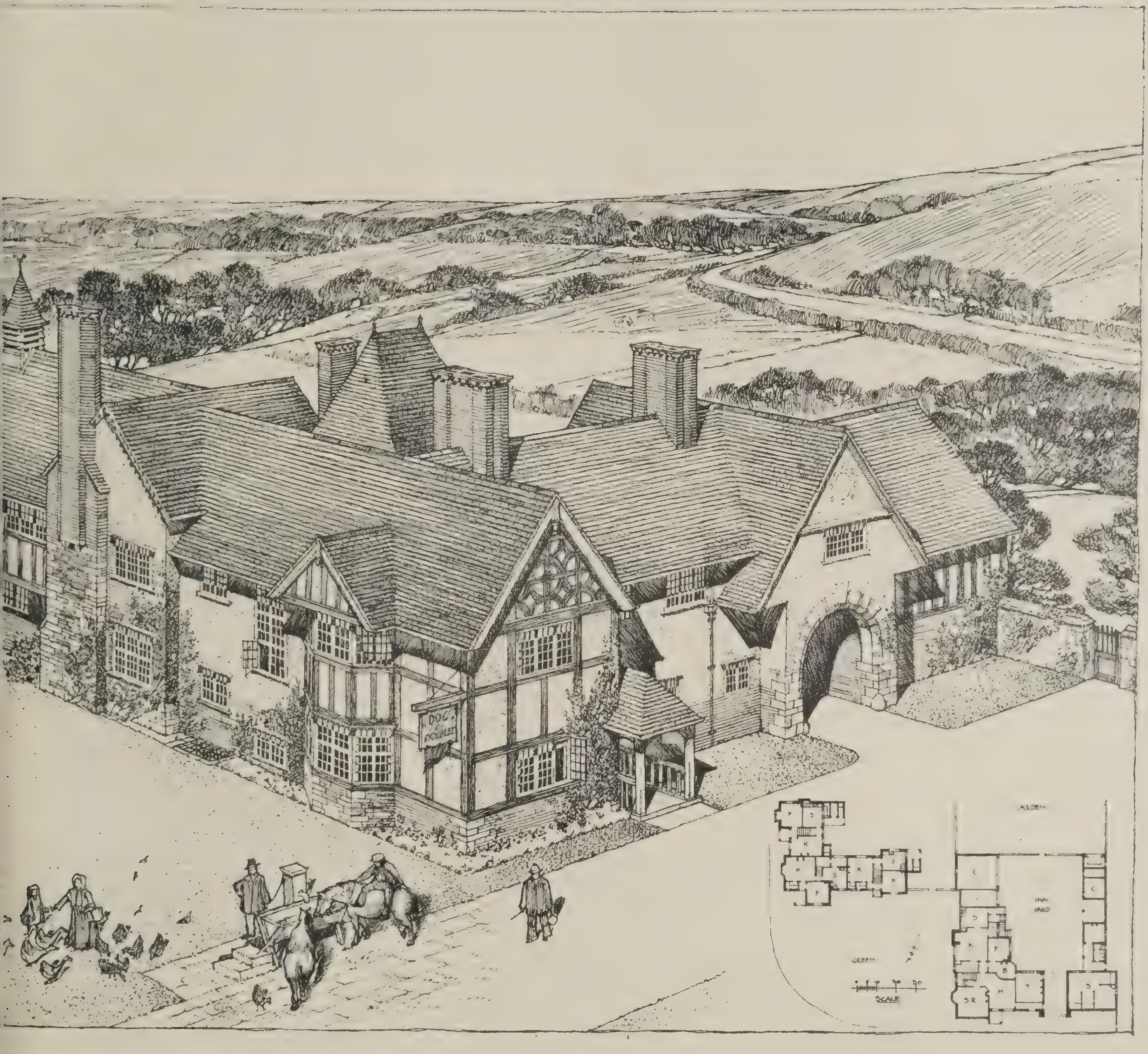
Supplement to
The Builders' Journal and Architectural Record,
Wednesday, May 10th, 1905.

"DOG AND DOUBLET" INN AND COTTAGES AROUND THE VILLAGE GREEN AT SANDON STAFFORDSHIRE
E. GUY DAWBER ARCHITECT


WINTON NEWMAN DEL.


DOG & DOUBLET
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AMERICAN PLUMBING.*

By J. PICKERING PUTNAM, Fellow of the American Institute of Architects.

THE committee on the revision of the building laws appointed in 1904 by the Boston Society of Architects have invited their fellow architects to aid them by sending suggestions, and the present paper is written with that end in view.

I have before me the plumbing ordinances of Boston, which are substantially in accord with those of the majority of large cities throughout the United States.

Fig. 1 shows the system of plumbing required by these ordinances. Let us first enumerate the amendments now advocated by the best authorities, in the order of their importance, and afterwards explain the reasons for each in detail.

(1) More than half of the increased complication is due to the so-called "back-venting" of the traps of all fixtures. We have, for instance, bath-tubs, wash-basins and other fixtures whose traps consist in bends in the pipe deep enough to present a barrier to the passage of drain-pipe air into the house. Our building law requires every such trap to be vented by a special air-pipe extending from the sewer side of the trap up to a point above the highest fixture on the stack, as shown in Fig. 1 by the smaller pipe between the fixtures and the 4in. soil-pipe. The original purpose of the law was to protect the trap seals from what is called "syphonage." But soon after it was enacted it was discovered that the air-current induced by the back-vent pipe was itself far more mischievous than the danger it was expected to remove, in that it operated to destroy the seal by evaporation; and so rapidly did it do this in some cases that in at least one large city the Board of Health felt obliged to issue notices to house owners advising them to have the traps refilled by hand in houses temporarily unoccupied, as often as once a fortnight, in order to restore the seal destroyed by back-venting.

It was also very soon found that the system was unreliable on account of deposits of greasy sediment within the vent-pipe and of snow or frost at its top, which rendered it inoperative; and other difficulties and dangers revealed themselves as time went on.

On the other hand methods of securing positive protection without back-venting were multiplied, until to-day the thinking man is puzzled to understand how the public can continue to allow to exist such a foolish and costly method of ensuring insecurity.

(2) The next important modification of the law recommended consists in the omission of the main house trap in the basement, and of the external sewer vent often resulting from its use.

(3) A third modification consists in requiring every fixture to be constructed with an outlet large enough to fill its waste-pipe "full bore," in order to keep these pipes clean by thorough flushing.

(4) A fourth consists in reducing the number of fixture traps required. The law now calls for a separate trap under each fixture, no matter how near to one another they come. An exception is made in the case of several adjoining wash-trays, which are allowed to have a single trap between them. This good feature should be extended to all adjoining fixtures. In such cases it is much more scientific as well as much safer and more economical to use one trap than several.

(5) Moreover, it is for important reasons better to place the trap at or below the floor-level than close to the fixture it serves, as is now required by law.

(6) A sixth modification consists in omitting, in most cases, the trap now called for on all rainwater leaders, because a trap here reduces the ventilation and increases the complication and expense. Moreover, this trap prevents the use of the main soil-pipe as a rainwater conductor. There is no possible way of flushing the soil-pipe better than by admitting rainwater, where the combined system of sewerage is used.

(7) A seventh modification consists in striking out the restriction in the law limiting the jointing of cast-iron pipes to lead calking. Probably no more unscientific method of construction now exists in the whole domain of house-building than this, iron and lead having no more constructive affinity for each other in jointing than cats and dogs. Other really scientific methods of jointing cast-iron have recently come into the market which are both reliable and much cheaper.

(8) Finally, the provision requiring water-closets to be supplied from cisterns with flush-pipes not less than 1in. in diameter should be modified. Better and simpler means for flushing are now known.

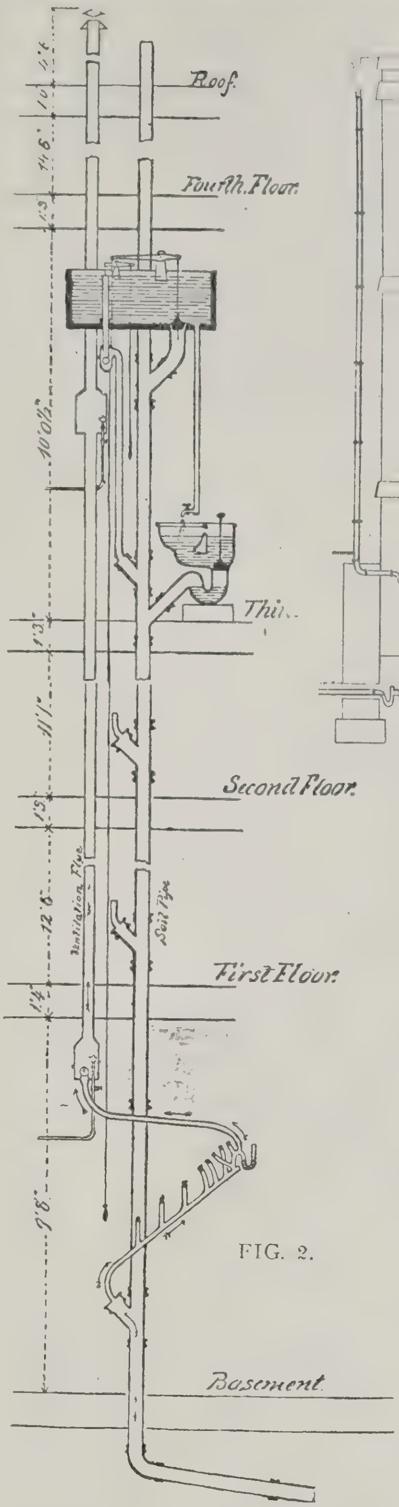

FIG. 2.

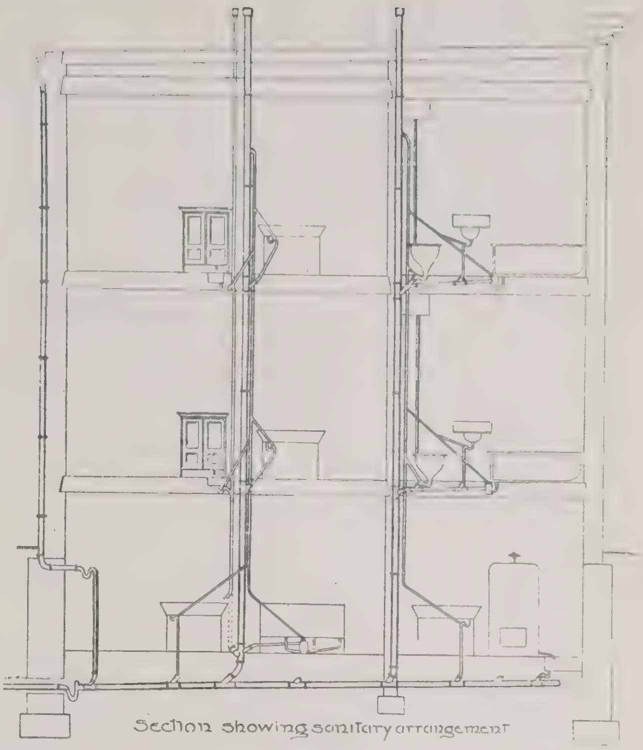

FIG. 1.

Syphonage.

Let us now examine more in detail our first proposed modification relating to the trap-vent law, and in order fully to understand this we must have a very clear idea of the phenomena of "syphonage" and "back-pressure."

Fig. 2 gives us a very clear idea of these mischievous forces. The main soil-pipe is shown in the centre and the back-vent pipe at the left. It is taken from the actual plumbing work used in a four-storey office building in Boston.

When water is discharged from the tank in the third storey it descends through the soil-pipe in the form of a plug or piston, and rarifies the air behind it, because the friction of the walls of the pipe prevents the air from the top of the pipe from following the water as fast as it falls. Consequently the water-seal of a trap placed on either of the branches below the tank will suffer by syphonage, since nature abhors even a partial vacuum, and therefore allows air to rush through all the traps in her effort to break it.

To speak more scientifically, the inertia of the water in the trap affords less resistance to the air than the friction along the sides of the soil-pipe, and if the trap is improperly constructed its water-seal is forced out in advance of the inrushing air-current, and this action is called "syphonage."

Back-pressure

is the reverse of syphonage. As the plug of water discharged from the tank descends toward the sharp bend in the basement, the air in front of the falling plug is compressed because the sharp end retards its escape, and this compressed air seeks a passage at every outlet. Back-pressure is therefore evidently strongest at branches which are near the bend in the basement, and syphonage is strongest at branches which are farthest from this bend. We have at the end of the basement branch an ordinary so-called S-trap. This trap possesses in itself almost no power of resistance to syphonage.

If a partial vacuum is produced in this large pipe, which represents our soil-pipe, and we allow air to pass through this small S-trap by opening the stop-cock between it and the soil-pipe, you see that the air has actually forced out enough of the water to entirely destroy the seal, leaving a free passage for soil-pipe air, sometimes called "sewer gas," to enter directly into the house.

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* Extracts from a paper read before the Society of Arts, Boston, U.S.A.

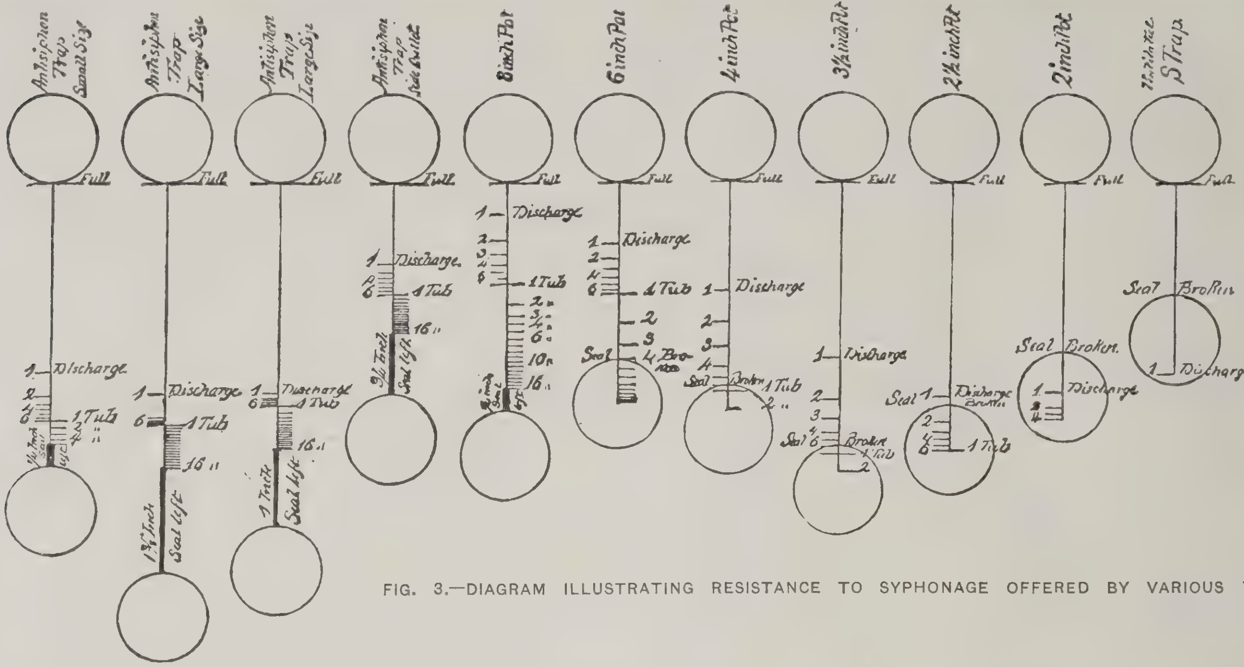

FIG. 3.—DIAGRAM ILLUSTRATING RESISTANCE TO SYPHONAGE OFFERED BY VARIOUS TRAPS.

Now the back-vent pipe was invented with the idea of providing an inlet for the air on the soil-pipe side of the trap, so that it could fill the vacuum in the soil-pipe without passing through the fixture and trap-seal, and in some cases the device actually does protect the seal. But, as already stated, it was soon found unreliable on account of friction, clogging, sagging and leaking, and because of its action in evaporating out the water seal.

How Evaporation Takes Place.

Fig. 2 shows how this evaporating action takes place. The air of a house being warmer in winter than the outer air, the ventilating current rising through the pipe in the direction shown by the arrows is conducted over or near the crown of the trap and escapes at the roof. In summer the reverse movement takes place with a similar result. This current evaporates out the trap-seal with a rapidity proportioned to its proximity to the trap, its dryness, temperature, rapidity of movement, and, in short, in proportion to its efficiency in performing its function of ventilating the branch waste-pipe and guarding the seal from syphonage, and in experiments which have been published from time to time it has been found that seals have been destroyed by this cause in actual plumbing work in less than ten days. If the vent is not connected with an S-trap at or near its crown it will not protect it from self-syphonage—hence the requirement in the Boston laws, which leads to a quick destruction of the seal by evaporation.

Fig. 3 indicates the power of resisting syphonage possessed by various kinds of traps. The vertical line between the two circles shows the depth of the trap-seals, and the short horizontal lines the amount of water removed at each discharge from the tank.

Clogging, Rusting and Sagging.

Fig. 4 illustrates some of the many ways in which the back-vent pipe fails in practice. Clogging with grease, as shown here over the sink-trap, is very common.

At every quick bend under a vertical run of iron vent-pipe rust is certain to collect. A comparatively small amount of flaking off of rust or sediment in such a place may suffice to destroy the efficiency of the pipe.

Sagging, as shown higher up, is another frequent cause of failure. Water and sediment collect in the sagged portion, and failure is again the result. Finally, hoar frost and snow often close the upper opening of the pipe above the roof, again producing failure.

Moreover, the chances of leakage by bad jointing are evidently increased in proportion to the increase of piping, and, what is more important still, no water-flush passes through the vent-pipes, and there is consequently nothing to announce to the eye the presence of leaks, which may therefore do mischief before the leaks are discovered.

Who are for and against the Law.

Although the amount of rough work in plumbing is increased by venting, yet the expense tends to decrease the number and quality of fixtures which the public can afford to instal, and reduces the confidence of the house owner in plumbing in general, so that plumbers do not see any advantage to themselves in the law. Pride in their work and a knowledge of the great advances made in the science of plumbing since the law was enacted prompt them now to advocate a change.

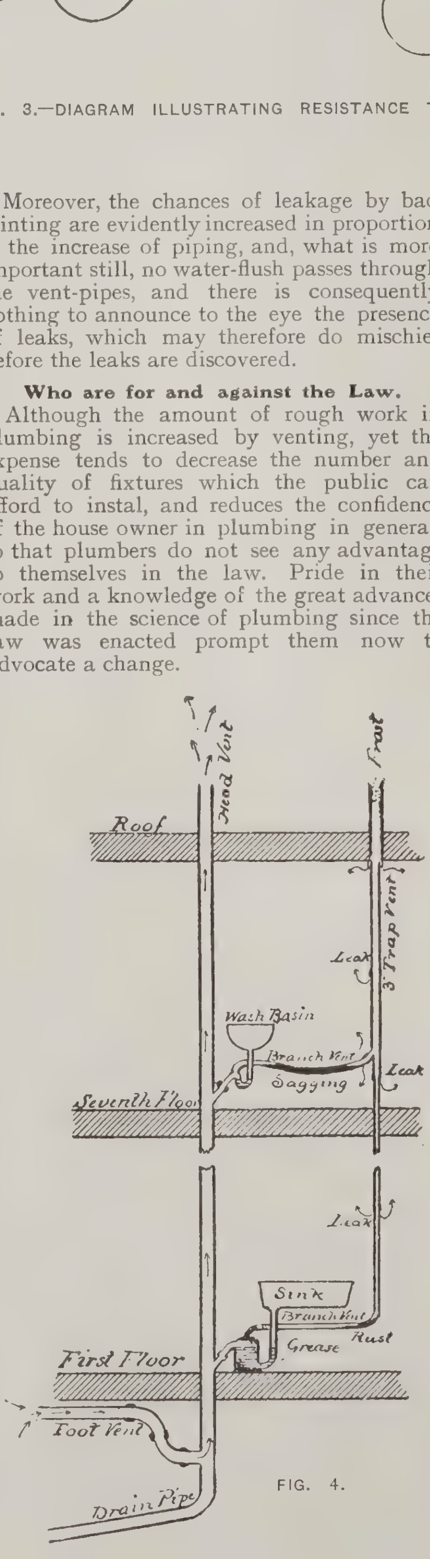

FIG. 4.

The pipe-dealers, on the other hand, appear to be the only gainers by the law, and these have, no doubt, constituted a powerful and active influence tending to its perpetuation.

Advantage of Anti-Syphon Traps.

I am now going to show that the back-vent system is not only not equal to the anti-syphon-trap system in power of resistance, but that it is so far inferior to it as to be altogether out of competition even with the poorer forms of anti-syphon traps. Let us first try the ordinary "round" or "pot" trap, of which I have here samples in several sizes with glass faces so that you can see the results of the tests. The depth of seal is the same in all, namely, 4½ins. We have applied to these traps the severest strains our apparatus can produce, which is a vacuum of 26ins., and we find the large sizes capable of resisting even this strain many times repeated. Indeed, it is practically impossible to syphon out our 5in. pot-trap.

Our 4in. and 3in. pot-traps have a lower resisting power, but are practically unsyphonable in plumbing work so long as they remain clean. They are thus immeasurably superior to the vented S-trap. We find their power of resistance is directly proportional to their diameter, and has nothing to do with their depth of seal.

Nevertheless, although the ordinary unvented pot or anti-syphon-trap is infinitely superior in all ways to the vented S, yet it has the one grave objection that it is not in all cases perfectly self cleansing.

Figs. 5, 6 and 7 show how sediment will collect in these traps, ultimately converting them into S-traps. The mouth of the vent-pipe is shown at the crown, and, never receiving a scour by the flushing, it is precisely the place where the floating greasy matters and fatty vapours most quickly collect. It thus loses its efficiency sooner than do the cesspool traps. The body of the S-trap is self-cleansing so long as a good flush is provided. Is it possible to obtain an anti-syphon-trap which shall possess this quality of the S? If so, our trap must be so formed that its sectional area shall in no place exceed the area of the fixture waste-pipe which it serves. This requirement confines us to the use of some form of plain piping, either straight or bent, in the construction of the trap. It is evident, also, that a considerable amount of this piping will be required in the formation of the trap in order to provide the necessary water capacity for resistance to back-pressure and evaporation; and all the piping used must be on a horizontal plane in order to preserve the required minimum depth of water-seal, as will be explained directly.

The first form of trap answering to these requirements is shown in Fig. 8 (No. 10). It consists of a 1½in. S-trap-seal proper and a long horizontal body made of a plain round 1½in. pipe. Opposite the trap proper is the sewer-connection piece, also made of a bent 1½in. pipe. I call the long body the "reservoir chamber." The water lies along the lower half of this chamber, leaving room, under syphonage, for air to pass above it without disturbing the water below it, provided the syphoning action is not too severe. The action is shown in Fig. 8 (No. 7). Less and less water is driven out of the trap at each syphoning action, because the air-space above the water is each time correspondingly enlarged and the resistance to syphonage is accordingly increased until a point is reached where no further reduction of its level by syphonage is possible; the water spray caused by the suction adheres to the long body while air escapes.

Nevertheless this form is too long and unwieldy to be practicable. Moreover, under strong syphonage waves are formed which, when they reach the top of the pipe, act like pistons in driving out the rest of the water. The wave may be broken up and the length reduced by bending the pipe back and forth on itself, as shown in Fig. 8 (No. 9). This trap has been tested and found able to withstand indefinitely the most powerful syphonage which can be applied, namely, a strain which in a single discharge destroyed the seal of a fully vented S-trap with a new vent-pipe only 10ft. long. The same strain broke the seal of an unvented 4in. pot-trap and syphoned out an S-trap having a seal 6ft. deep, Fig. 8 (No. 4).

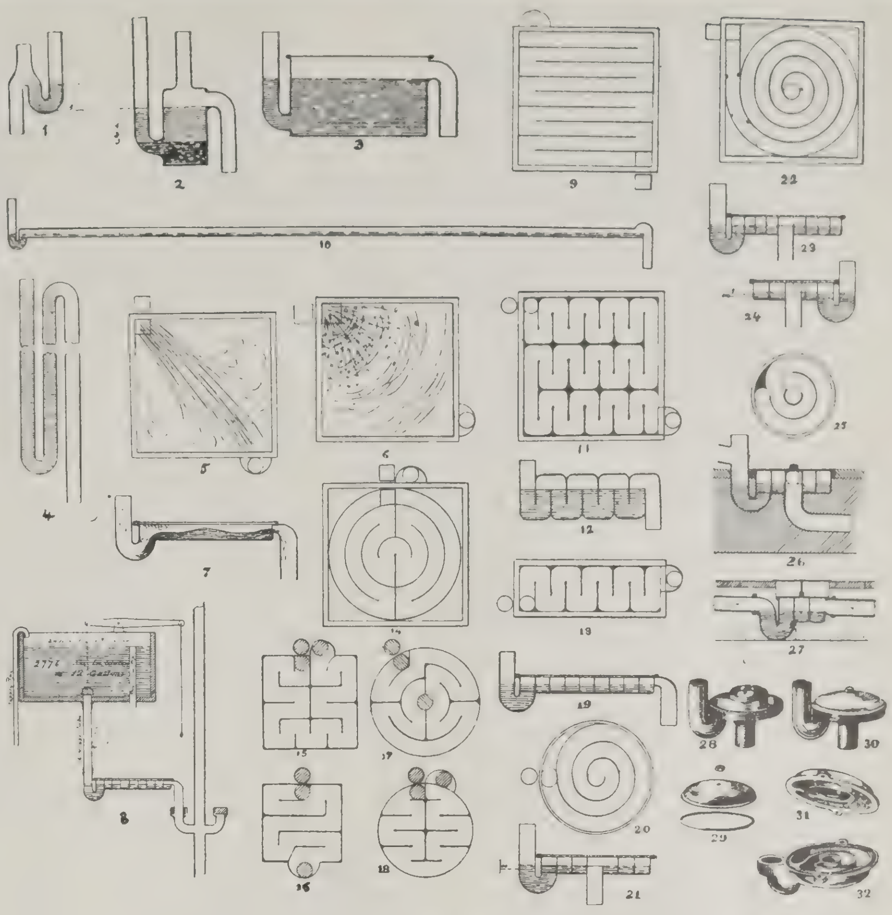

FIG. 8.

Another arrangement of the pipe is shown in Fig. 8 (No. 11), which may be reduced in size, as in No. 13, when it will be seen by comparing it with No. 12 to be nothing but a series of ordinary S-traps laid on their sides, and we have thus really succeeded in rendering an S-trap permanently anti-syphonic. The trap is, in fact, vented through its own inlet-pipe.

This trap can, however, still be improved by giving it the form shown in Fig. 12, in which friction is reduced and centrifugal force aids in the separation of the air from the water, leaving the latter in the trap while the former escapes. The resisting power of this trap is now so great that we can materially reduce its size until we have the forms shown in Fig. 8 (Nos. 20—21 and 25—32). Should this trap be used under a fixture having a small outlet, and therefore furnishing little or no scour, it will act like a straight pipe, and will, like it, in time suffer a diminution of its area by accumulation of greasy or gelatinous deposit along its wall. But, as in a straight pipe, the accumulations will be substantially uniform throughout, because the scour and form is uniform throughout, and its resistance to syphonage will remain the same, because its principle of resistance thereto will remain unchanged. Indeed, the size of the trap in respect to its proportion to the sectional area of its waterway will increase and thus correspondingly increase its resistance to syphonage. Should it ever be completely closed, its closure will announce itself by the simple cessation of the waste-water to flow out, and then the obstruction can be removed through the clean-out cap.

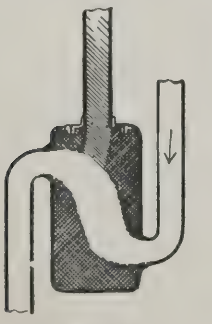

FIG. 5.

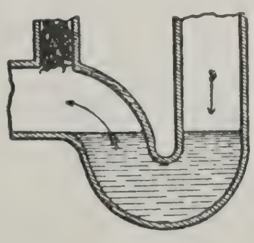

FIG. 6.

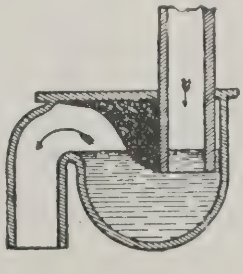

FIG. 7.

Flushing.

The champions of back-venting have abandoned their original claim that it served to protect trap seals from syphonage. They occasionally adhere to it, however, on the argument that it is needed to purify the branch waste-pipes by aëration.

But it is now recognized that ample water-flushing through properly constructed fixture outlets, followed by an equally thorough pure-air flushing from the room through the fixture and trap, is infinitely more effective than ventilation with foul air alone from the soil-pipe through the back-vent pipe, and is, indeed, altogether sufficient.

Hence the law should require every fixture to be constructed on the principle of the "flush-tank" by having outlet and outlet-valves large enough to fill their waste-pipes and traps "full bore" at every discharge.

Some Examples from American Buildings.

Fig. 9 is a diagram of a tall building in which, in compliance with the law, I was obliged to specify trap-vent pipes 125ft. in height. As you see, the lavatories are placed over one another in such a position that the distance from their traps to the main ventilated soil-pipe is not more than 18ins. or 20ins. These short branch wastes were powerfully flushed at each usage of the fixtures by a stream of water filling them "full bore" and discharging at the rate of nearly half a gallon a second. Traps were specified which cannot by any possibility be syphoned out or even have their seals seriously lowered. No better illustration of the wastefulness of this requirement could be found, except in the case of alterations where the installation of the vent-pipe may destroy much valuable property and create loss for the greatest part of the cost of the whole work. My client, in the case of this tall building, lost over a thousand dollars for the privilege of seriously endangering, through evaporation, the seals of his traps.

Figs. 10 and 11 show the same fixtures in a house plumbed in two different ways—Fig. 10 being in accordance with my recommendations and Fig. 11 being in accordance with the manner now sometimes seen in the finest houses. On the extreme left of the latter is the outside sewer vent, and on the inside, next to this, is the house-trap and circulation-vent. We have also back-vents, drip-vents and rainwater pipe, and all of these unnecessary stacks are very common in the modern house.

Fig. 12 shows a part of this work enlarged. It is taken from a well-known house in New York. Fig. 13 is taken from two other

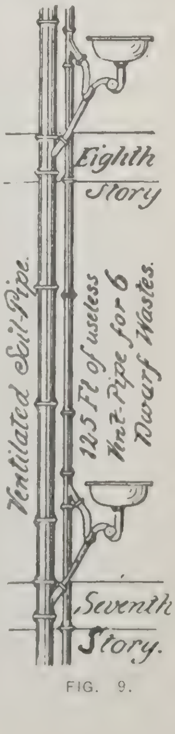

FIG. 9.

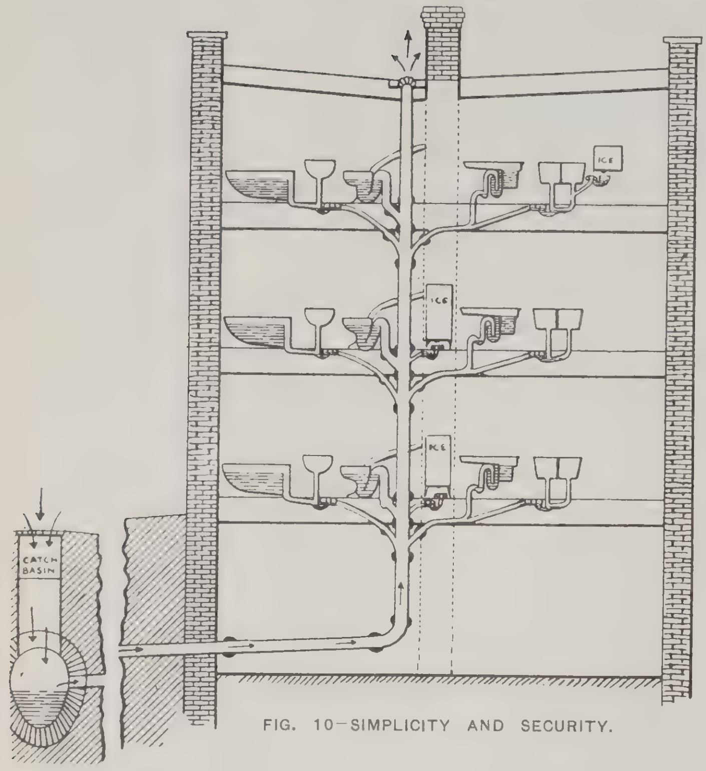

FIG. 10—SIMPLICITY AND SECURITY.

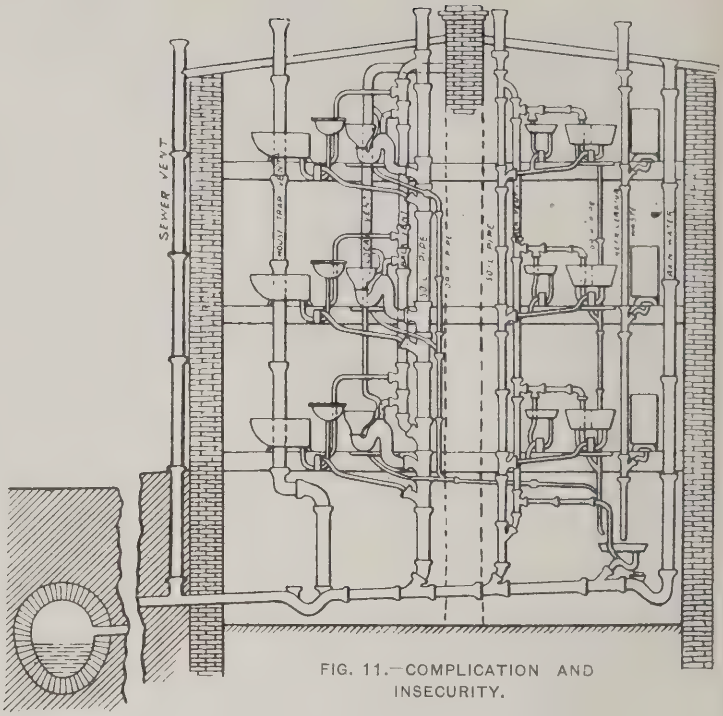

FIG. 11.—COMPLICATION AND INSECURITY.

handsome New York residences, and Fig. 14 from still another house in the same city. If this absurd complication continues at the rate it has been going for the last two decades, the public will feel disposed to return to the old-fashioned method of sewage-disposal shown in Viollet-le-Duc's picture.

Against the Intercepting Trap.

My reasons for urging legislation prohibiting the use of the main house trap or "intercepting" trap are, first, because its use prevents the best and only efficient and practical method of adequately ventilating the sewers, and, second, because it adds an altogether useless expense and complication to the plumbing.

Fallacies about Germs in Sewers.

Recent investigations by eminent scientists have shown us the fallacy of the popular idea that the air of sewers abounds in disease germs, and so sightseers may now visit the famous sewers of some of the great cities of the world with the same feeling of safety they enjoy while seeing other regular "sights."

Germs are "particulate," as Dr. Carmichael, of Scotland, expressed it, and have no more power to raise themselves from the water or moist surfaces of sewers than have any other particles of vegetable matter, like leaves or small sticks. If, by any chance, parts of the sewage above the normal level of the flow become dried, as in periods of drought, and are then lifted and wafted along by some unusually strong air-current, it is found that they very soon fall again into the water by gravity or are carried against a wet surface in a bend or branch of a sewer by the same air-current that lifted them. Furthermore, it has lately been discovered—and the discovery satisfactorily corroborated, especially by the noteworthy and most interesting researches of the Englishmen, Lawes and Andrewes—that the specific germs of disease do not thrive even in the water itself of sewers. They appear to be destroyed by other species of germs, harmless to man, which abound there.

In short, it has been determined that the dreaded germs of specific diseases are, of all places, least to be sought for in the air of sewers. They may abound in the air of the streets above the sewers, but not in that of the sewers themselves. Hence, if they are borne into our dwellings by air-currents at all, they must enter by way of doors and windows and not by way of the drains.

Note that we are speaking of germs and not of odours and gases.

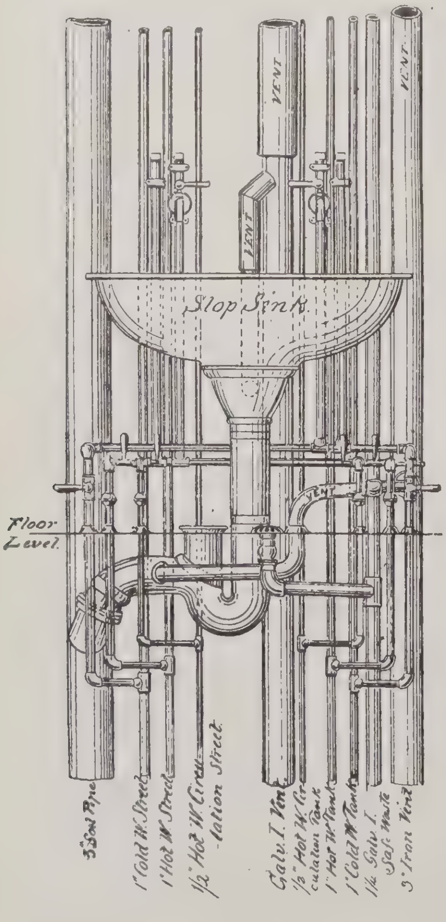

FIG. 13, FROM A NEW YORK RESIDENCE, ILLUSTRATING THE COMPLICATION OF PIPES.

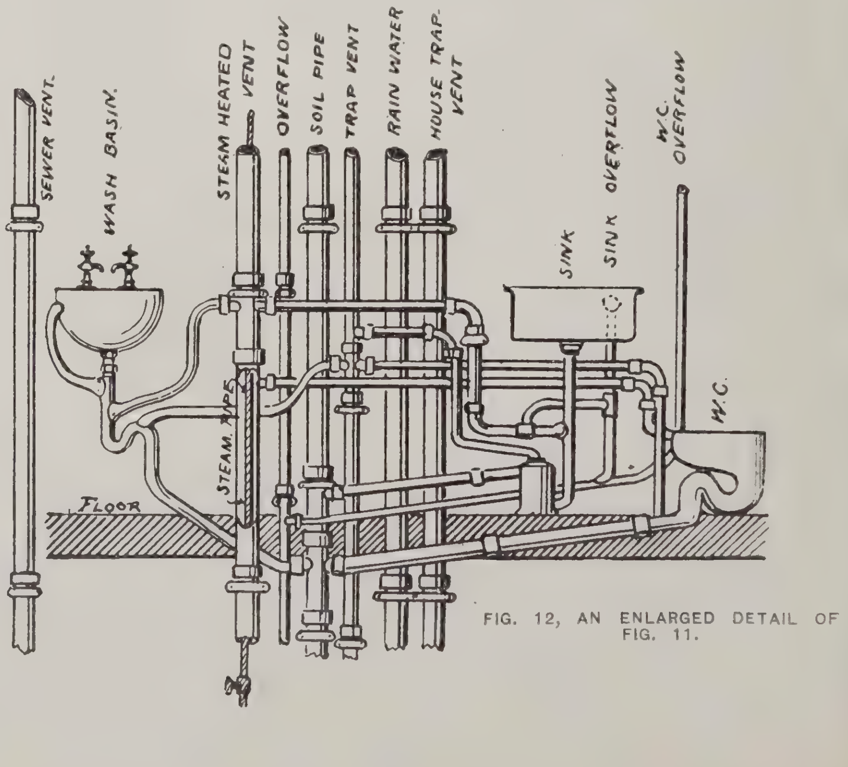

FIG. 12, AN ENLARGED DETAIL OF FIG. 11.

These latter do abound in the air of badly-ventilated sewers and are unwholesome to breathe continuously. But they are immediately dangerous only when in an exceedingly concentrated form, and are easily excluded from houses by simple precautions and by proper plumbing regulations One of the most effective and rational of these precautions is thorough sewer and drain-pipe ventilation.

Ventilation of Sewers.

In the past sewers were sometimes ventilated by means of tall chimneys and fans and other devices built especially for the purpose at intervals in their length. But these experiments have proved failures because they produced too powerful a suction in the immediate vicinity of the ventilators and none at all a short distance away from them, and were, withal, exceedingly costly.

Simple openings into the sewers at intervals along the streets are common, but they provide no motive-power to effect proper ventilation. The foul sewer may thus remain foul, and an opening here and there at the street level only concentrates the nuisance in the worst manner at special places for the annoyance of the public.

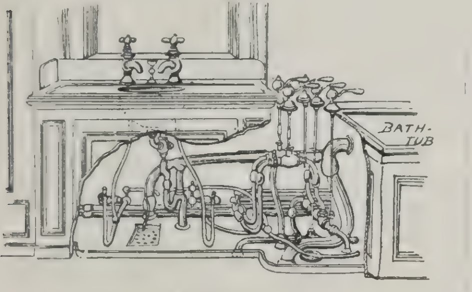

FIG. 14.

It is much better to carry the foul gases to the tops of the houses than to emit them at the street-level under the very noses of the passers-by. Soil-pipes can now be constructed and jointed so as to be absolutely tight, and the objection that it is dangerous to carry the sewer-air through the houses is no longer tenable.

A public sewer becomes very well ventilated and practically safe when its ventilation is effected by making every house-drain and soil-pipe a ventilating flue. The sewer has then, in cities, special 4in. suction tubes every 10ft. or 15ft. throughout its entire length, the houses averaging, say, 20ft. or 25ft. in width. We know that whatever putrescible matter, excepting street washings, is to be found in the sewers comes from the house drains themselves.

Assuming, then, that the houses average 25ft. wide and 50ft. high, the number of running feet of soil and drain pipe in each would average at best not less than 100ft., and the interior surface would therefore contain probably at least twice as much decomposing matter as the 12ft. of sewer serving each house. Hence it would be absurd to insert a disconnecting trap and a vast increase of extra piping for the mere purpose of excluding this small extra drain-pipe air, even if it were not demonstrated that this very complication increased rather than diminished the chances of its entrance.

Even the foulest sewers and cesspools must cease to be foul the moment they are ventilated through every soil-pipe. Probably the most dangerous substance in our sewers to-day is illuminating-gas escaping from leaky mains, which modern science has (I believe it can be maintained) at last rendered unnecessary. The house-trap is responsible for the presence of this gas in cellars and subways.

It it exceedingly important that it should, where formed, be diluted and carried up above the houses and thus rendered comparatively harmless.

IN PARLIAMENT.

(By Our Press Gallery Representative.)

On Thursday last the House of Commons occupied its time chiefly in affairs of domestic concern.

The Ventilation of the House.

Mr. Wylie criticized the ventilation and sanitation of the House. He contended that there was an insufficient distribution of air in the chamber, and that the system of forcing air up through the floor was radically wrong. The air was too dry, and he was supported in his opinion by that eminent sanitarian, Dr. Gordon. Dr. Gordon declared that, in view of the unsatisfactory results of the present system, some better means of ventilation should be sought, especially those systems which included overhead ventilation.

Mr. Dillon said the problem of ventilation was an extremely difficult question. When he first entered the House the conditions were such as would have disgraced a common lodging-house. Members were being poisoned, and many lost their lives by atrocious and scandalous conditions, which had only been remedied at great expense.

Lord Balcarres' Statement.

Lord Balcarres, referring to the criticisms of the existing system of ventilation, pointed to the difficulty of making the temperature suit every member. The temperature of the House at the moment was 61. Mr. Bowles had suggested opening the windows, but if any member went down below with the engineer-in-charge and saw the system of ventilation at work, he would revise his opinion if he thought that system could be condemned. It was simply astonishing to observe the amount of dirt that was intercepted in foggy weather three floors below the House and which would otherwise come through the windows or the floor if they did not possess the cleansing apparatus. It was no empiric system that they had put in. It had been examined by expert after expert, and as far as he could see it was a very good system indeed—suitable, that was to say, for their special requirements. He had been asked whether the recommendations of that distinguished bacteriologist, Dr. Gordon, were compatible with the present arrangements. He was informed that those recommendations were not incompatible with the exising system. The First Commissioner of Works had asked Dr. Gordon to go into this matter, the report of the Ventilation Committee not being definite or final on certain points.

Mr. Dillon asked whether Dr. Gordon condemned the system of air passing through the floor.

Lord Balcarres: Far from it. Acting on Dr. Gordon's advice, certain improvements in the existing system were made. A committee of experts had been appointed, consisting of Sir Michael Foster, Dr John Haldane and Dr. M. H. Gordon, and they would report to the First Commissioner in the autumn or next winter. A comparison had been made between the House of Commons and a town hall, but he pointed to the prolonged sittings of the House of Commons as proving the necessity of having a system like the present one, by which automatic and almost unconscious improvement of the air was going on from moment to moment. As for the bacteriological tests that had been applied to the House, no owner of a town hall or theatre and no incumbent of a church would dare to submit his building to similar tests. He would by doing so create a panic in the audience.

Abingdon Street Improvement Scheme.

Replying to Mr. Dalziel and Mr. Whitley, Lord Balcarres said a sum of £10,000 in the Estimates was money paid to the County Council in respect of a house in Abingdon Street which had been recently acquired under their improvement scheme. The arrangement would enable the County Council to carry out a great improvement, while the block of property obtained by the First Commissioner would in all probability be used hereafter for Government offices.

New Works at the Royal Palaces.

Mr. Whitley called attention to the increase in the vote for new works, alterations and additions in connection with the Royal Palaces.

Lord Balcarres said the two large items which caused the increase were the extension of the electric light in St. James's Palace and Hampton Court Palace. At Hampton Court there were a large number of people resident who used paraffin oil lamps and candles. The safety of this historical monument would be better preserved by the use of electric light than by the use of hand-lamps.

The Facade of Buckingham Palace.

Colonel Welby asked if there was any intention to bring Buckingham Palace façade more into harmony with the Queen Victoria Memorial. He asked whether there could not be any cleaning of the façade or painting of the woodwork.

Lord Balcarres said the question of Buckingham Palace could not be properly dealt with until the memorial was erected. Probably when the memorial was up, the Palace would look more handsome than it did now. The question must, in the meantime, stand over.

The New Road in the Green Park.

Mr. Bowles complained of the cutting-down of trees in the Green Park, the destruction of two acres of grass, and the making of a "nefarious, hard, broad road," which was supposed to be for foot passengers but which bore the marks of a road for vehicular traffic. He denounced the path as a gross outrage, which practically spoiled the most precious park in London. He suggested spending another £4,000 in getting the unemployed to restore the path to its original grassy condition.

Sir. A. Hayter joined in the protest.

Lord Balcarres said Mr. Bowles did not quite appreciate the situation. This path did not make a thoroughfare across Green Park. It was an integral part of the memorial, and it had been planted on either side with three rows of trees. In the course of time they would have an avenue of trees leading from a great thoroughfare to a great memorial analogous to the Broad Walk at Kensington. The object was to have a fine vista. There was no intention of using the road for carriage traffic, and it had not been constructed for that purpose.

War Office and Triennial Contracts.

Before the House rose for the Easter Holidays,

Sir Lewis M'Iver asked the Secretary of State for War whether it had been decided to abolish the triennial-contract system of executing alterations and repairs to barracks and fortifications, and whether instructions had been issued in the Southern Command to employ labour at once, by way of experiment, with a view to the War Department eventually adopting a system of carrying out the repairs by means of labour employed directly.

Mr. Arnold Forster: It has not been decided to abolish the system of triennial contracts of repairs altogether, but it is the intention in those cases in which the work can be done satisfactorily and efficiently, to replace the present triennial-contract system by the employment of day labour. It is understood that this plan has been adopted by the Admiralty with success. Instructions have been issued to the various general officers commanding requesting them to enquire and report whether the conditions of the various divisions of their commands are suitable for the adoption of the new method.

Complete List of Contracts Open.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		BUILDING:		
May	10	Golden Grove, Llandilo—Alterations, &c., to Church	——	D. Jenkins, Architect, Llandilo.
,,	11	Wilsden, Yorks—House	——	Wilson Bailey, Tanfield Buildings, Bradford.
,,	11	Cardiff—Panelling, &c., Council Chamber	County Borough	J. L. Wheatley, Town Hall, Cardiff.
,,	11	Oldbury—Block of Schools	Education Committee	A. Long, New Street, West Bromwich.
,,	11	Bristol—Sheds	Docks Committee	W. W. Squire, Cumberland Road, Bristol.
,,	11	Chumleigh, Devon—Residence, &c.	Mr. F. B. Mitchell	T. Sanders, Chawleigh Week, Chumleigh.
,,	11	Gilfach, Wales—Chapel, &c.	English Calvinistic Methodists	W. Harris, Gilfach, Pengam.
,,	11	Scunthorpe, Lincs—Market Buildings	Urban District Council	A. M. Cobban, Home Street, Scunthorpe.
,,	12	Londonderry—Residence	Town Council	Engineer's Office, 1A Strand, Londonderry.
,,	13	Alnwick—Infirmary	——	J. W. Douglas, Alnwick.
,,	13	Mountain Ash, Wales—School	Urban District Council	W. G. Thomas, Public Offices, Mountain Ash.
,,	13	Ramsgate—Flight of Steps	Corporation	T. G. Taylor, Albion House, Ramsgate.
,,	13	Weston-super-Mare—School	Education Committee	Price & Jane, Weston-super-Mare.
,,	13	Dundalk—Shop	Messrs. Macardle, Moore & Co., Ltd.	J. F. M'Gahon, Roden Place, Dundalk.
,,	13	Brithdir, Wales—Church	Rev. T. Richards	Vicarage, Bargoed.
,,	14	Penygraig, Wales—Alterations, &c., to House	Mr. J. H. Kendrick	Lewis & Morgan, Dunraven Street, Tonypandy.
,,	15	Belfast—Goods Office	Great Northern Railway Co.	W. H. Mills, Amiens Street Terminus, Dublin.
,,	15	London, W.—Disinfecting Station	Kensington Royal Bor. Council	W. Weaver, Town Hall, Kensington High Street, W.
,,	15	Convoy, Ireland—Alterations, &c., to Premises	Convoy Woollen Co., Ltd.	M. A. Robinson, Richmond Street, Londonderry.
,,	15	Dublin—Electricity Generating Station	Port and Docks Board	J. P. Griffiths, East Wall, Dublin.
,,	15	Caerau, Wales—Enlargement of Chapel, &c.	Welsh Congregational Church	D. J. Davies, Tonnan Road, Caerau.
,,	15	Donaghadee, Ireland—Two Villas	——	T. Houston, Kingscourt, Wellington Place, Belfast.
,,	15	Knaphill, Surrey—Alterations to Schools	Education Committee	Jarvis & Richards, 36 Victoria Street, Westminster.
,,	15	Lanivet, Bodmin—School	Education Committee	District Education Office, Bodmin.
,,	15	Pontypridd—Alteration to School	Education Committee	P. R. A. Willoughby, Surveyor to Council, Pontypridd.
,,	15	Tressillian, Cornwall—Alteration to School	Education Committee	A. J. Cornelius, Architect, Truro.
,,	15	Norwich—Alterations, &c., to Premises	Masonic Association, Ltd.	A. C. Havers, 1 Bank Plain, Norwich.
,,	16	Coleraine, Ireland—Malt Barn and Kiln	Brown, Corbett & Co.	Killowen Distillery, Coleraine.
,,	16	Pentre—Villa	Mr. W. Williams	J. Rees, Architect, Pentre.
,,	17	Carrog—Schoolroom	——	W. F. Jones, Corwen.
,,	17	St. Johnston, Ireland—Hall	Committee of Masonic Lodge	M. A. Robinson, 3 Richmond Street, Londonderry.
,,	18	Paxford, Worcs.—Rebuilding Bridge	Highways & Bridges Committee.	J. H. Garrett, Shire Hall, Worcester.
,,	19	Broad Oak—Church	——	J. E. Bowen, 78 Monnow Street, Monmouth.
,,	19	Chartham, Kent—Repairs, &c., to Wards	Committee of Lunatic Asylum	W. J. Jennings, 4 St. Margaret's Street, Canterbury.
,,	20	Bilston—Boys' School	Urban District Council	F. M. Cooper, Education Offices, Town Hall, Bilston.
,,	20	Hampton, near Evesham—Rebuilding Bridge	Highways and Bridges Committee.	J. H. Garrett, Shire Hall, Worcester.
,,	20	Ebbw Vale—Chapel and Schoolroom	Trustees of Nebo Baptist Church	H. Waters, Beaufort.
,,	22	Newcastle—Baths and Washhouses	Corporation	City Property Surveyor's Department, Town Hall, Newcastle.
,,	22	Antwerp—Exhibition Hall	Commercial Intelligence	Offices of Branch of Board of Trade, 73 Basinghall Street, E.C.
,,	22	Chelmsford—Block of Buildings at Hospital	Joint Hospital Board	A. S. Duffield, 96 High Street, Chelmsford.
,,	26	Aldeburgh, Suffolk—Engine-house	Corporation	J. C. Gordon, Aldeburgh.
,,	26	Warrenpoint—Erecting and Completing Orange Hall	——	S. W. Reside, Margaret Square, Newry.
		ENGINEERING:		
May	11	East Ham—Iron Staircase	Education Committee	R. L. Curtis, 11 and 12, Finsbury Square, E.C.
,,	11	Glasgow—Repair of Embankment	Corporation	Office of Public Works, City Chambers, Glasgow.
,,	11	Kilkenny—Pump	Rural District Council	K. Comerford, Clerk, Kilkenny.
,,	13	Paisley—Electric Power Generating Plant	Gas Corporation	G. R. Hislop, Gasworks, Paisley.
,,	13	Poole—Piling, &c.	Harbour Commissioners	H. F. J. Barnes, Towngate Street, Poole.
,,	13	Blackburn—Boiler	Town Hall & Baths Committee	W. Stubbs, Municipal Offices, Blackburn.
,,	13	Manchester—Exhauster, &c.	Gas Committee	C. Nickson, Town Hall, Manchester.
,,	15	Montreal—Pumping Plant	Water and Power Co.	Company's Office, 62 Alliance Buildings, 107 St. James' St., Montreal, Canada.
,,	15	Barrow-in-Furness—Bridge	Corporation	Sir B. Baker, 2 Queen Square Place, Queen Anne's Mansions, S.W.
,,	15	Irvine, N.B.—Gas Plant, &c.	Corporation	Kirkland & Capper, 17 Victoria Street, S.W.
,,	15	Coventry—Purifiers	Gas Committee	F. W. Stevenson, Gasworks, Coventry.
,,	16	London, E.C.—Bridges	South Indian Railway Co.	Company's Offices, 55 Gracechurch Street, E.C.
,,	16	London, S.E.—Accumulators	London County Council	County Hall, Spring Gardens, S.W.
,,	16	Erith, Kent—Dredging	London County Council	Maurice Fitzmaurice, County Hall, Spring Gardens, S.W.
,,	16	London, S.W.—Cranes	London County Council	County Hall, Spring Gardens, S.W.
,,	17	Saxmundham, Suffolk—Borehole	Urban District Council	P. F. Mackenzie-Richards, 53 Victoria Street, S.W.
,,	20	Weston Subedge—Waterworks	Pebworth R.D.C.	E. Wadams, Union Offices, Evesham.
,,	22	Glasgow—Electric Arc-light Installation	Clyde Navigation Trustees	G. H. Baxter, Mechanical Engineer, Clydebank Dock, N.B.
,,	22	Newcastle—Boilers, &c.	Finance Committee	City Property Surveyor's Department, Town Hall, Newcastle.
,,	23	Antwerp—Bridge	——	M. le Directeur-Général, Société National des Chemins de fer Vicinaux, 14 Rue de la Science, Brussels.
,,	24	Aldeburgh—Pumping Machinery	Corporation	J. C. Gordon, Aldeburgh.
,,	25	London, N.E.—Artesian Well	Hackney Borough Council	R. Hammond, 66 Victoria Street, S.W.
,,	30	Sydney, New South Wales—Refuse Destructor	Municipal Council	Acting Agent-General for State of New South Wales, Victoria St., S.W
		IRON AND STEEL:		
May	11	East Ham—Iron Staircase	Education Committee	R. L. Curtis, 11 and 12 Finsbury Square, E.C.
,,	12	Karachi, India—Structural Ironwork	Port Trust	D. Morris, c/o H. S. King & Co., 65 Cornhill, E.C.
,,	15	Bristol—Iron and Steel	Sanitary and Improvement Committee.	Offices, 63 Queen Square, Bristol.
,,	18	Egham—Iron Fencing	Rural District Council	W. Menzies, Englefield Green, Surrey.
Sept.	1	Sydney, Australia—Iron and Steel	——	Agent-General's Office, 9 Victoria Street, S.W.
No date		London, S.W.—Railways	——	C. Rivett-Cernac, 23 Ashburn Place, S.W.
		PAINTING AND PLUMBING:		
May	11	Bacup, Lancs—Painting Exterior of Club	——	Secretary, Liberal Club, Bacup.
,,	11	Carlisle—Painting Work at Police Office, &c.	Corporation	H. C. Marks, 36 Fisher Street, Carlisle.
,,	13	Shoreham—Painting Schools	Education Committee	Potter & Harvey, 49 London Road, Sevenoaks.
,,	17	Lasswade—Painting Ironwork of Bridge	Water District Committee	County Road Surveyor, County Rooms, Edinburgh.
		ROADS AND CARTAGE:		
May	12	Worcester—Slab-paving	Highways and Bridges Committee.	J. H. Garrett, Shirehall, Worcester.
,,	12	Newmarket—Road Metalling	Urban District Council	S. J. Ennion, Deva Chambers, Newmarket.
,,	12	London, S.E.—Kerbs	Penge U.D.C.	H. W. Longdin, Town Hall, Anerley, S.E.
,,	13	Argoed, Mon.—Roads, &c.	——	Gustard & Waddington, Tredegar Chambers, Bridge Street, Newport.
,,	13	Soyland, Yorks—Road Works	Urban District Council	J. Rodsworth, Ripponden.
,,	13	Tredegar, Mon.—Limestone	Urban District Council	Clerk, Town Hall, Tredegar.
,,	15	Ashton-in-Makerfield—Street Improvement Works	Urban District Council	A. Sykes, Clerk, Ashton-in-Makerfield.
,,	15	Batley, Yorks—Road Works	——	Marriott, Son & Shaw, Church Street Chambers, Dewsbury.
,,	15	Grays, Essex—Road Material	Orseft R.D.C.	F. T. Johnson, 2 Orsett Road, Grays.
,,	15	Hale, Cheshire—Making-up Road	Urban District Council	T. Blagburn, Surveyor, Hale.
,,	16	London, E.C.—Paving Work	Corporation	Engineer to Corporation, Guildhall, E.C.
,,	16	Rushden, Northants—Road Materials	Urban District Council	W. B. Madin, Vestry Hall, Rushden.
,,	17	Bournemouth—Roads, &c.	Town Council	F. W. Lacey, Municipal Offices, Bournemouth.
		SANITARY:		
May	11	Ecclesfield, Yorks—Sewer, &c.	Wortley R.D.C.	G. E. Beaumont, Grenoside, Sheffield.
,,	11	Tettenhall, Staffs—Sewer	Urban District Council	Council Offices, Upper Green, Tettenhall.
,,	15	Oystermouth, near Swansea—Sewer Cleansing	Urban District Council	M. Hoskins, Council Offices, Oystermouth.
,,	15	Kensington—Disinfection Station	Urban District Council	W. Weaver, Town Hall, Kensington High Street, W.
,,	15	Glasgow—Sewers	Corporation	City Engineer, City Chambers, 64 Cochrane Street, Glasgow.
,,	16	Bradford—Scavenging	Cleansing Committee	E. Call, Destructor Works, Hammerton Street, Bradford.
,,	17	Scarborough—Convenience, &c.	Town Council	H. W. Smith, Town Hall, Scarborough.

Current Market Prices

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0	1	3	0
Clover, best	per load	3	15	0	4	2	6
Hay, good	do.	3	10	0	3	15	0
Sainfoin mixture ...	do.	3	10	0	3	17	6
Straw	do.	1	12	0	2	0	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ...	per cwt.	1	0	5		—	
Colza Oil, English ...	do.	1	2	3		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0		—	
Linseed Oil, barrels ...	per cwt.	0	19	9		—	
Petroleum, American ...	per gal.	0	0	$5\frac{1}{8}$		—	
Do. Russian ...	do.	0	0	$4\frac{5}{8}$		—	
Pitch	per barrel	0	8	0		—	
Shellac, orange	per cwt.	7	5	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	4	0		—	
Tar, Stockholm	per barrel	1	6	6		—	
Turpentine	per cwt.	2	5	3		—	

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ...	per ton	80	0	0		—	
Iron, Staffs., bar ...	do.	5	17	6	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	5	0		—	
Lead, pig, Soft Foreign...	do.	12	12	6		—	
Do. do. English common brands	do.	12	17	6		—	
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14	0	0		—	
Do. pipe	do.	15	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	5	0		—	
Do. floor brads... ...	do.	9	0	0		—	
Steel, Staffs., Girders and Angles	do.	5	5	0	6	0	0
Do. do. Mild bars ...	do.	6	0	0	6	5	0
Tin, Foreign	do.	138	15	0	139	5	0
Do. English ingots ...	do.	137	10	0	139	0	0
Zinc, sheets, Silesian ...	do.	28	0	0		—	
Do. do. Vielle Montaigne	do.	29	0	0		—	
Do. Spelter	do.	24	0	0	24	5	0

TIMBER.

Soft Woods.

		£	s.	d.	£	s.	d.
Whitewood, American, logs.	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	3	0
Fir, Dantzic and Memel	per load	2	10	0	4	15	0
Pine, Quebec, Yellow ...	do.	4	0	0	7	10	0
Do. Pitch, American	do.	2	8	0	5	0	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, Nederkalix, Yellow, 1st, 4×9	per std.	11	15	0		—	
Do. do. do. do. 3×8	do.	9	10	0		—	
Deals, Blankaholm Yellow, 1st, 4×9	per std.	11	10	0		—	
Do. do. do. do. 4×8	do.	10	0	0		—	
Do. do. do. do. 4×6	do.	9	5	0		—	
Do. do. do. do. $2\frac{1}{2}$×7	do.	9	5	0		—	
Do. do. do. 2nd, 4×9	do.	10	15	0		—	
Do. Petschora Yellow, 3rd, 3×11	do.	10	10	0		—	
Do. Archangel, White, 1st, 3×11	do.	9	15	0	13	10	0
Do. do. Yellow, 2nd, 3×9	do.	14	15	0		—	
Do. do. do. 3rd, 3×9	do.	11	0	0		—	
Do. do. do. 4th, 3×11	do.	7	10	0		—	
Do. do. do. Unsorted, 3×11	do.	6	15	0		—	
Do. Galatz White, 3×11	do.	5	0	0		—	
Do. St. Petersburg, Yellow, 1st, 3×9	do.	11	10	0	13	5	0
Do. do. do. Unsorted, 3×9	do.	9	15	0		—	
Do. Kovda, Yellow, 3rd, 3×9	do.	11	0	0		—	
Do. do. do. 4th, 3×9	do.	9	5	0		—	
Do. Gefle, Yellow, 3rd, 3×9	do.	11	10	0		—	
Do. do. do. do. $2\frac{1}{2}$×7	do.	9	10	0		—	
Do. Keret, Yellow, 2nd, 3×9	do.	13	10	0		—	
Do. Kem (White Sea), Yellow, 3rd, 3×9	do.	11	5	0		—	
Do. Bay Verte Hemlock Spruce, Unsorted ... 3×9	do.	5	0	0		—	
Do. do. do. do. 3×7	do.	5	0	0		—	
Do. Batiscan Spruce, 2nd, 3×9	do.	9	15	0		—	
Do. Quebec, Spruce, 3rd, 3×9	do.	9	0	0		—	
Do. do. do. Unsorted, 3×9	do.	6	12	6		—	
Battens, all kinds ...	do.	6	0	0	13	0	0
Flooring Boards 1in. prepared, 1st... ...	per square	0	10	6		—	
Do. 2nd	do.	0	9	9		—	
Do. 3rd, &c.	do.	0	6	9	0	9	0

Hard Woods.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	3	17	6	7	5	0
Birch, New Brunswick...	do.	2	10	0	5	0	0
Do. Quebec do. ...	do.	2	10	0	5	15	0
Box, Turkey	per ton	7	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	$3\frac{1}{2}$	0	0	$3\frac{1}{2}$
Do. Honduras ...	do.	0	0	3		—	
Do. Tobasco	do.	0	0	$3\frac{3}{8}$	0	0	$4\frac{11}{16}$
Elm, Quebec	per load	4	0	0	8	10	0
Jarrah, planks	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras...	per ft. sup.	0	0	$4\frac{7}{32}$	0	0	$4\frac{13}{16}$
Do. African ...	do.	0	0	$2\frac{31}{32}$		—	
Do. St. Domingo	do.	0	0	4		—	
Do. Cuba ...	do.	0	0	$3\frac{29}{32}$		—	
Do. Lagos ...	do.	0	0	4		—	
Do. Benin ...	do.	0	0	$2\frac{21}{32}$		—	

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending May 5th seventeen failures in the building and timber trades in England and Wales were gazetted.

J. S. HANNAFORD, builder, Plymouth. R.O. April 28th.

M. A. LYNEX, builder, Walsall. Adj. April 28th.

A. HAIGH, painter and decorator, Mexborough. R.O. April 27th.

R. HUNT, builder and contractor, Sheffield. R.O. April 28th.

A. LYONS, builder and contractor, Malton. Adj. April 27th. Liabilities £3,564; deficiency £768.

EVAN & DAVIES, builders and contractors, Trawsfynydd. R.O. April 26th.

J. WOODGATE, builder, Eastbourne. P.E., Eastbourne Town Hall, May 30th, at 2.30.

A. GALE, builder and contractor, Fleet. R.O. April 28th.

J. T. McCLUNG, plumber, glazier and contractor, Manchester. R.O. April 28th.

T. W. RICHARDS, joiner and builder, Tibshelf. Adj. April 27th.

J. BRIDGEMAN, builder, Weymouth. P.E., County Hall, Dorchester, May 26th, at 2.30.

B. J. BERRY, builder and contractor, Altrincham. R.O. April 29th.

TOPPING & BOUGHEY, builders, New Brighton. First meeting, O.R.'s, Liverpool, May 10th, at 2.30. P.E., Birkenhead C.C., June 29th, at 11.

W. FORSTER, plumber, Carlisle. R.O. April 26th. P.E., Carlisle C.C., May 15th, at 11. First meeting, O.R.'s, Carlisle, same day, at 3.

BROMWICH & CLARK, slate merchants, Croydon. R.O. April 28th. First meeting, London Bankruptcy Court, May 12th, at 11. P.E., same, May 31st, at 11.30.

H. & F. FEARMAN, builders and decorators, Hatton Garden. P.E., London Bankruptcy Court, May 25th, at 12.

W. LAYTON & Co., builders, Fulham. R.O. April 26th. First meeting, London Bankruptcy Court, May 15th, at 2.30. P.E., same, June 2nd, at 11.30.

JOHNSON BROTHERS, stone merchants and contractors, Hartley, Monkseaton and Whitley Bay. P.E., Newcastle-on-Tyne C.C., May 11th, at 11.

C. J. EDWARDS, builder, Thornton Heath. First meeting, 24, Railway Approach, London Bridge, May 10th, at 11.30. P.E., Croydon C.C., May 17th, at 11.

H. W. COATES, plumber, Leeds. First meeting, O.R.'s, Leeds, May 10th, at 11. P.E., Leeds C.C., May 30th, at 11.

C. A. HADLET, painter and paperhanger, Stockton-on-Tees. P.E., Stockton-on-Tees C.C., May 17th, at 10.30. First meeting, O.R.'s, Middlesbrough, same day, at 3.

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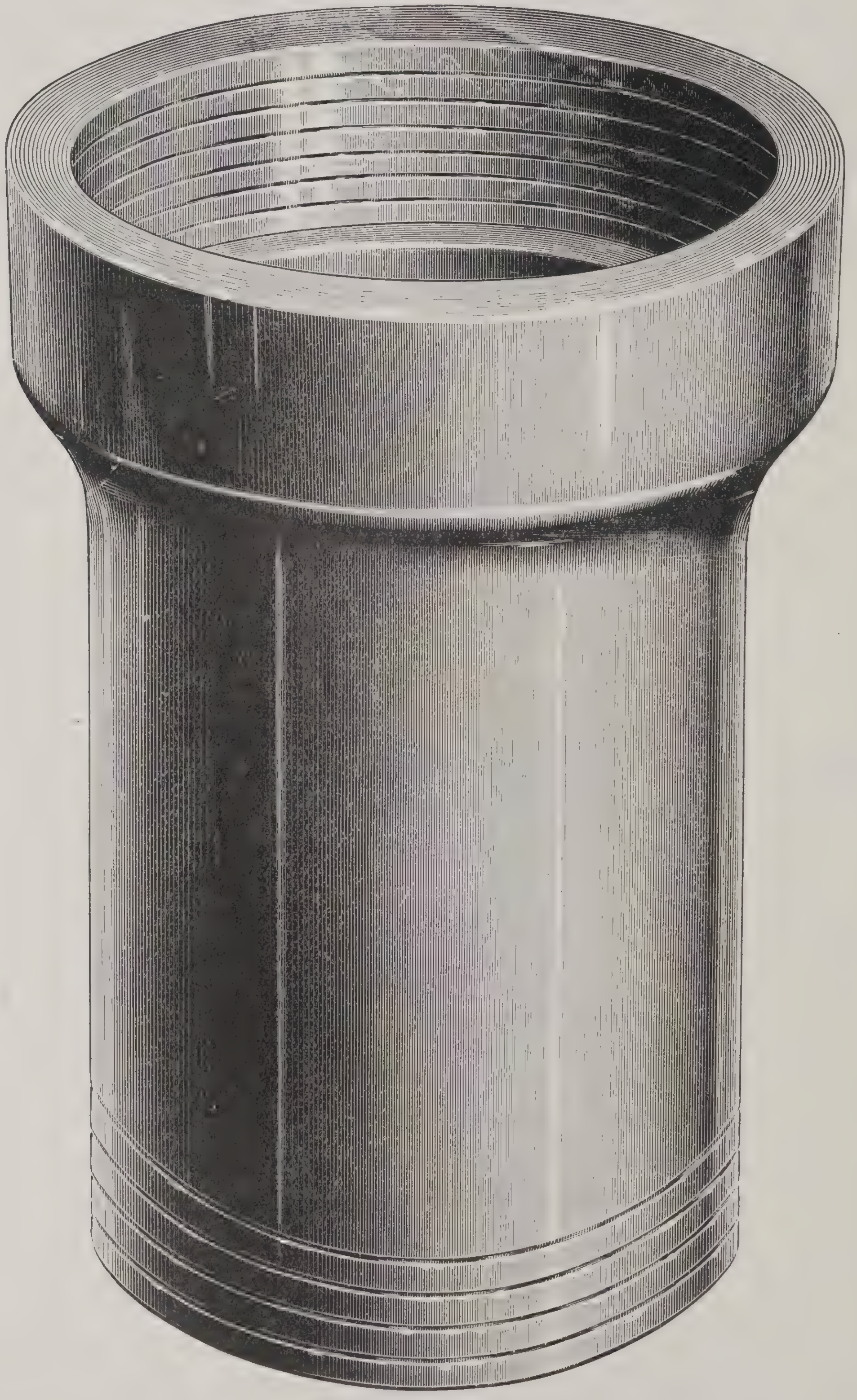

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DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		SANITARY—*cont.*		
May	20	Windsor—Sewerage Works	Rural District Council	A. M. Fowler, 1 St. Peter's Square, Manchester.
,,	24	Carlton, near Nottingham—Sewers, &c.	Urban District Council	J. C. Haller, Surveyor's Office, Carlton.
		TIMBER:		
May	15	London, W.—Paving Blocks	St. Marylebone Borough Council	J. P. Waddington, Town Hall, Marylebone, W.
,,	16	London, S.W.—Sleepers	Central S. African Railways	Crown Agents for Colonies, Whitehall Gardens, S.W.

List of Competitions Open.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
May	15	Rochester—Institute	50, 20 and 10 guineas	£1	William Banks, City Surveyor, Rochester.
,,	24	Harrogate—Orphanage	——	10s.	Rev. J. T. Barkley, Riche Mont, Harrcgate.
June	1	Donegal—Lighting Scheme	——	——	D. C. Pearson, Clerk, Donegal.
Aug.	1	Perth—Reconstruction of Hall	30, 20 and 10 guineas	——	J. Begg, City Chambers, Perth.
,,	1	Perth—Erection of new Hall	50, 30 and 20 guineas	——	J. Begg, City Chambers, Perth.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C.

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Barnard Castle.—Accepted for the erection of a villa at Startforth, for Mr. J. Moffatt. Mr. T. Farrow, architect, 7, Market Place, Barnard Castle:—

Bricklayer and mason.
R. Wilson, Victoria Terrace East, Barnard Castle.
Carpenter and joiner.
P. Robinson, Lartington, Barnard Castle.
Slater.
J. Mascall, Bishop Auckland.
Plumber and glazier.
C. Raine, Horse Market, Barnard Castle.
Painter.
P. Robinson, Lartington, Barnard Castle.

Biggleswade (Beds).—For the erection of Sunday schools, for the Trustees of the Biggleswade Wesleyan Methodist Society. Mr. Thomas Cockrill, A.M.I.C.E., architect, Market Square, Biggleswade:—

W. Wade, St. Neots	£1,675
W. Howard, Huntingdon	1,650
G. Wrycroft & Sons, St. Neots	1,505
C. Wright, Longford,* Biggleswade	1,444

* Accepted.

Doncaster.—For the erection of two new shops and premises, for Mr. A. Stubbs. Mr. J. Athron, architect, 10, Priory Place, Doncaster. Quantities by architect:—

D. Gill & Son	£2,997	0	0
C. Sprakes & Sons	2,850	0	0
F. Beastall	2,670	0	0
Mullins & Richardson	2,643	15	5
S. Beastall & Sons,* Doncaster	2,562	15	11
B. Ashton & Sons†	2,467	11	3

* Accepted. † Withdrawn.

Gravesend.—For the erection of Wesleyan church and schools. Messrs. W. J. Morley & Son, architects, Craven House, Kingsway, London, W.C.:—

Gann & Co., Whitstable	£5,857	0	0
T. Pearce, Thornton Heath	5,850	5	0
F. Miskin, Ltd., Gravesend	5,849	6	9
A. S. Ingleton, Herne Bay	5,678	16	0
J. Wilford, Snodland	5,639	0	0
Lawrence & Son, Waltham Cross	5,562	19	0
L. Seagar, Sittingbourne	5,341	19	0
A. E. Tong, Gravesend	5,325	16	2

And other tenders varying from £5,892 to £8,200.

Hanley.—For extensions to the municipal secondary school, for the Hanley Education Committee. Mr. Edward E. Scrivener, architect, Howard Place, Hanley:—

J. Bagnall, Fenton	£3,387	0	0
A. Ward, Hanley	3,774	0	0
Tompkinson & Bettelley, Longton	3,530	0	0
G. Thomas,* Hanley	3,319	0	0
Cornes & Sons, Hanley	3,315	0	0
P. H. Bennion, Longton	3,130	15	0

* Accepted subject to sanction of Board of Education.

London, E.C.—For restoration works at the Shoreditch Town Hall, for the Borough Council:—

J. Fergusson & Co., Tottenham	£22,853
W. Nash, Deptford	21,570
F. & A. Willmott, Ilford	21,359
Spencer, Santo & Co., Westminster	21,137
J. Appleby & Sons, Lambeth	21,090
A. E. Symes, Stratford	21,029
J. Chessum & Sons, Bow	20,639
Redding & Son, Cambridge	20,575
L. F. Lamplough, Notting Hill	20,555
Rowley Brothers, Tottenham	20,516
L. H. & R. Roberts, Islington	20,428
F. G. Minter, Putney	20,275
Kirk & Randall, Woolwich	20,176
Waring & Gillow, Oxford Street	20,143
Mattock & Parsons, Gray's Inn Road	20,066
H. Kent, Lewisham	20,063
Martin, Wells & Co., Vauxhall	20,003
Wilkinson Brothers, Finsbury Park	19,798
E. Lawrence & Sons, City Road	19,606
Leslie & Co., Kensington	19,586
W. Lawrence & Co., Waltham Cross	19,549
H. L. Holloway, Deptford	19,253
C. G. Hill, Finsbury	19,130
W. Johnson & Co., Wandsworth	18,860
B. E. Nightingale, Albert Embankment	18,741
Killby & Gayford,* Worship Street	18,690

* Accepted.

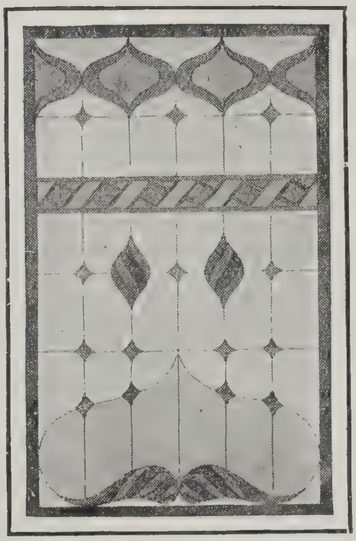
London, S.W.—For cleaning and painting works at the Grove Hospital, Tooting, for the Metropolitan Asylums Board:—

H. Hann, Merton	£8,652	6	9
W. Smith & Sons, Croydon	6,787	0	0
C. A. Adams, Streatham	6,421	9	11
F. Kinnaird, Brixton	6,295	0	0
J. Shelbourne & Co., Wandsworth	6,250	0	0
E. Triggs, Clapham	4,609	0	0
H. C. Payne, South Lambeth	3,997	0	0
Higgs & Hill, Ltd., South Lambeth	3,993	0	0
Wontner & Co., Ltd., 56, City Road, E.C.	3,873	0	0
W. Reason, 47, Rosebery Avenue	£3,579	0	0
C. Cruse, Earl's Court	3,550	0	0
A. H. Inns, Watford	3,321	14	0
H. Bragg & Sons, Brixton Road	3,219	0	0
J. S. Fenn, Woolwich	2,990	0	0
H. Kent, Lewisham	2,954	0	0
E. Wall, Tooting	2,922	0	0
M. McCarthy, Clapham Park	2,771	0	0
E. Proctor & Son,* 326, High Street, Plumstead	2,705	0	0

[Engineer-in-chief's estimate, £2,900.]

* Accepted.

(Continued on next page.)



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TENDERS—*cont. from p.* xxi.

Minehead (Somerset).—For the erection of a house and stables, for Mr. T. Ball, of Alag, Dunckesz, Hungary. Mr. A. L. Cox, architect, Minehead :—

Harrison & Son	£1,399	0	0
Passmore & Derrick	1,389	17	7
Burgess & Son*	1,358	0	0

* Accepted. [All of Minehead.]

Peckham.—For rebuilding Nos. 2 and 4, Choumert Road, for Mr. R. Price. Mr. T. Wilson, architect, 34, New Bridge Street, E C. :—

C. Wall, Ltd.	£1,092
Nightingale	1,059
Lidstone	1,026
Leslie & Co.	1,025
Coleman & Co.	1 020
J. Chessum & Sons*	1,019

* Accepted.

St. Bees.—For the erection of new chapel, laboratories lecture hall and library at St. Bees School. Mr. John F. Curwen, F.S.A., F.R.I.B.A., architect, Kendal :—

Laboratories, &c.

Clark & Robinson, Barrow	£6,500	0	0
Moorhouse, Whitehaven	£6,223	14	0
Bradley, Millom	6,207	0	0
H. Tinnion, Maryport	6,083	2	0
Grisenthwaite, Penrith	6,010	18	10
J. Smith, Egremont	5,821	6	7
Anderson, Whitehaven	5,724	0	0
Laing, Carlisle	5,606	2	10
Pennington,* Kendal	5,533	10	0
Gradwell, Barrow	5,475	0	0
J. Young, Whitehaven	5,409	19	6
Hatch, Lancaster	5,395	0	0
Lister, Manchester	5,162	0	0
Ferguson, Harrington	4,889	14	7
Bragg, Workington	4,599	13	2
J. I. Wilson, Workington	4,402	18	1

Chapel.

Clark & Robinson	3,700	0	0
Bradley	3,372	0	0
Grisenthwaite	3,051	13	6
Anderson	3,006	0	0
J. Smith	2,990	10	0
Gradwell	2,975	0	0
Hatch	2,875	0	0
J. Young	2,855	7	4
Moorhouse	2,845	17	6
Laing	2,835	12	11
Pennington*	2,826	11	6
Bragg	2,770	7	7
H. Tinnion	2,700	4	0
Lister	2,633	0	0
J. I. Wilson	2,577	5	1
Ferguson	2,548	3	0

* Provisionally accepted.

Coming Events.

Thursday, May 11.

CARPENTERS' COMPANY.—Prof. F. M. Simpson. F.R.I.B.A., on "Timber Roofs, Partitions and Floors," at 8 p.m.

ROYAL SANITARY INSTITUTE.—Annual Dinner, Prince's Restaurant, Piccadilly, at 7 p.m.

Saturday, May 13.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Sketching Club Excursion.

ARCHITECTURAL ASSOCIATION.—First Summer Visit to Northwood Sanatorium (Mr. Frederick Wheeler, architect). Train leaves Baker Street at 2.15 p.m.

INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.—Meeting at Market Harborough.

JUNIOR INSTITUTION OF ENGINEERS.—Visit to the Barking Water, Gas and Electricity Works. Train leaves Cannon Street at 1.30 p.m.

Monday, May 15.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Sculpture and Architecture, at 8 p.m. Papers by Mr. Alfred Gilbert, R.A., Mr. T. Stirling Lee, Mr. W. Reynolds Stephens and Professor Lanteri.

SURVEYORS' INSTITUTION.—Meeting at 8 p.m.

Wednesday, May 17.

INSTITUTE OF SANITARY ENGINEERS.—Examination and Literary Committee at 3.30 p.m. Finance Committee at 5 p.m. Council Meeting at 7 p.m.

Thursday, May 18.

SOCIETY OF ARCHITECTS.—Mr. G. Hubbard, F.S.A., F.R.I.B.A., and Mr. A. W. S. Cross, M.A., F.R.I.B.A., on "The Statutory Registration of Architects," at 8 p.m.

Friday, May 19.

SOCIETY OF ARCHITECTS.—Annual dinner, De Keyser's Royal Hotel, at 7 p.m.

Saturday, May 20.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to Dundee.

New Companies.

D. AND C. RUTTER, LTD., manufacturers of bricks, tiles, pipes, &c., 41, Parliament Street, S.W. Capital: £33,500.

ELLKAY AND CORNES, LTD., to adopt an agreement with the Ellkay Patent Bath Syndicate, Ltd., the Ellkay Colonial, Foreign and Export Co., Ltd., and James Cornes, Bath House, 59, Holborn Viaduct, E.C. Capital: £80,000.

CARMARTHENSHIRE SILICA CO., LTD., to acquire the business carried on at the Pistill Limeworks and Silica Quarries, at Llandebie, Carmarthenshire, by Penson and Southern, Ltd. Capital: £10,000.

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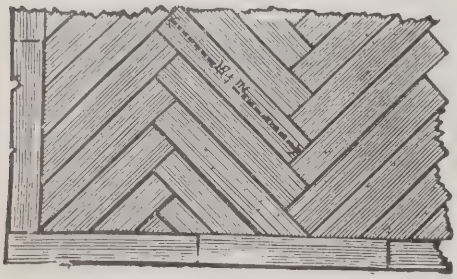

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MONTHLY

FIRE SUPPLEMENT

TO THE

BUILDERS' JOURNAL AND ARCHITECTURAL RECORD.

Edwin O. Sachs, F.R.S.Ed., Architect, Consulting Editor.

**Number 7.
May, 1905.**

FIRE PREVENTION AND THE INTERNATIONAL FIRE SERVICE COUNCIL.

THE International Fire Service Council, which was founded in 1900 on the occasion of the Paris International Exhibition, and originally only dealt with the interests of the fire service, is gradually becoming an important factor on the fire-preventive side. This is due in the first instance to the increasing importance attached to fire-prevention by officers of the professional brigades having control of largely-populated areas, and secondly to the fact that since 1903 not only fire-brigade corporations but also fire-preventive associations are represented on this body. There can be no doubt that eventually fire-protection will comprise mainly the science of fire-prevention supplemented by fire-service work, and that the fire service will in a manner become an auxiliary body to that of general building control, as is already the case in several countries. It is also evident that eventually practically all chief officers of fire brigades will be men of high technical standing, such as officers of the technical branches of the Army and Navy, civil engineers, borough surveyors and architects. The whole tendency at the present moment is for the fire service to be controlled by the technical professions, and not to be looked upon merely as work controllable by superior artizans.

Thus with pleasure we see from a public announcement that the International Fire Service Council have now formed a standing committee on fire-prevention, the two English representatives on which are Mr. Edwin O. Sachs, F.R.S.Ed., and Mr. Ellis Marsland, the district surveyor.

The headquarters of the Council are at Luxemburg, and from the Luxemburg offices enquiries on fire-preventive questions are now answered with the aid of the standing committee, which meets from time to time and also carries out a considerable amount of its work by correspondence.

Another matter which we are pleased to hear was decided on at the recent International Fire Service Council's meeting at Brussels was that a dictionary of technical terms relating to fire-prevention and fire service will be issued in the German, French and English languages. This should fill a long-felt gap.

The influence of the Council is rapidly on the increase, and the Council's delegates, which now number about 150, represent a general membership of close on three million persons, and the Council has again elected an executive of high technical standing, eleven in number, under the chairmanship of Colonel Sextus Meyer, late of the Danish Royal Engineers, who is chief of the Copenhagen fire brigade.

It is well to know that technical enquiries can be put to the Council through the agency of the societies represented on it in this country, which are—the National Fire Brigades Union, the British Fire Prevention Committee and the Association of Professional Fire Brigade Officers.

IMPENDING FIRE TESTS.

THE testing station of the British Fire Prevention Committee is to be moved from Porchester Road, Bayswater, owing to the widening of the line of the Great Western Railway, which abuts on to one side of the property, and which has made it impossible for the Committee to have its lease renewed.

The move is, of course, one of great inconvenience and at the same time very serious expense to the Committee; but having regard to the importance of the investigations it has been decided to re-instal the testing station at an early opportunity so that new tests may again be expected towards the middle of June. The extra expense is no doubt again being met by the public-spirited minority of the members who have so long from time to time put their hands in their pockets to assist in the possible conduct of these operations, which are necessarily of such a costly character. It has, of course, long been suggested that the Committee might well move its testing station away into the country, where its tenure would be permanent, and where, owing to cheapness of ground, it could obtain such an area as to have no immediate neighbours. We understand, however, that the Executive have decided to meet the wishes of the general membership and of the workers of the Committee and keep the testing station within an easy cab drive of Charing Cross so as not to make the attendance of members subject to train journey and time-tables, as this would probably very much interfere with the attendance of many who are interested and prevent their giving the work the attention they can afford. For this reason we understand that a site has been obtained in the neighbourhood of the Committee's first testing station near Hanover Gate, Regent's Park, and an announcement may shortly be anticipated to that effect. The Committee at the new testing station, we understand, will not erect any small-sized huts but only large sized huts, measuring 20ft. by 10ft., and it is also now intended to have one extra large hut 20ft. by 15ft.

Materials and systems of construction awaiting test at the present moment are as follows:—

Wire glass casements and skylights by Messrs. Ramsey Speer (U.S.A.).

Concrete floor with broad flange girders by Messrs. Skelton & Co. (London).

Floor by Messrs. Faber (Berlin).

A floor and girder coverings by Messrs. the New Expanded Metal Co.(London) (2nd test).

Wire glass skylights by Messrs. Pilkington (London) (5th test).

A partition by the Asbestic Brick and Tile Co. (London) (2nd test).

A floor and a partition by the National Fireproofing Co. (U.S.A.).

A roller shutter door by Messrs. Gibson & Co. (London).

A door test by the Gilmour Door Co. (Canada and London).

It will thus be seen that the Committee have their hands full with their summer testing operations, and we understand that additional applications are to be expected in respect to several floor and partition systems which have not yet come under investigation.

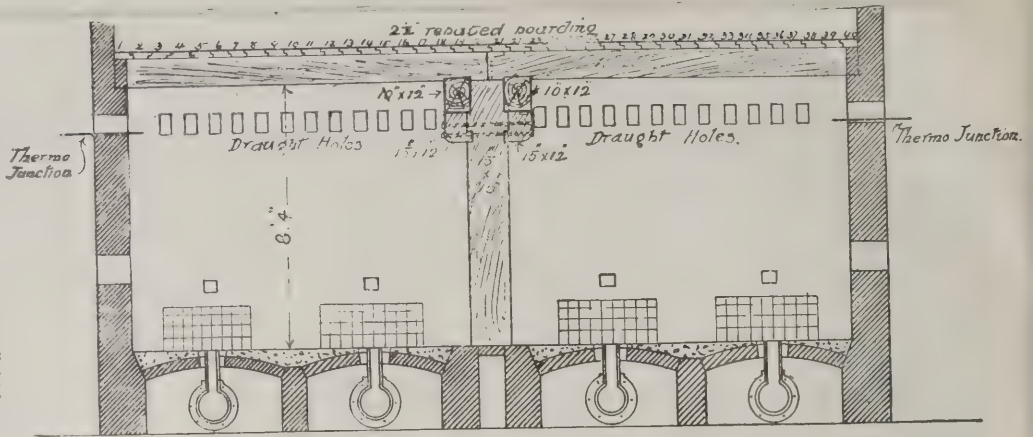
THE BUILDING TRADES' EXHIBITION.

THOSE who will recollect the first organized attempt to call attention to the growing importance of the exhibits relating to fire prevention at the Building Trades' Exhibition will marvel at the rapid strides that have been made during the last four years in this special department of the building trades. Although there have, of course, long been individual exhibits relating to fire-prevention at the earlier Building Trades' Exhibitions, it was not until 1901 that the British Fire Prevention Committee, in conjunction with Mr. Montgomery, arranged for a special hall to be reserved for what were at that time termed the "fireproofing" exhibits, and for the year in question an eminently interesting show was certainly made. The primary supporters of this "fireproofing" section were the late Mr. Arthur Cates, the late Mr. Thomas Blashill, and Sir John Taylor, K.C.B., the senior members of the Council of the Committee at that time. The Minor Hall, which was allotted to the subject in 1901, is somewhat isolated in its location, and it would perhaps have been better already at that time for the organizers to be so ambitious as to have made a group of these exhibits in the main hall. But this little group of fire exhibits of 1901 nevertheless fulfilled its purpose, and whilst the 1903 exhibition already showed a material advance in exhibits of this class, this year's exhibition showed such a number of floors, partitions, &c., intended to be fire-resisting that the space occupied by these specialities certainly formed a very considerable proportion of the space occupied on the main floor of the great Islington hall.

It was certainly most appropriate that Lord Windsor called particular attention to the fire-preventive exhibits in his address at the opening of the exhibition, for it was these exhibits in particular which mark the evolution of the building trades in the direction of safer and better building and formed the *clou* of the 1905 show.

Individual exhibits we have dealt with in our previous numbers, but perhaps we should specially mention that a number of the exhibitors very wisely made a point of indicating that their work had been tested officially. We are pleased to see also that tests with non-proprietary articles have had their influence upon various manufacturers. Taken all round, the exhibition certainly advanced the movement of fire-prevention, and those interested in the subject should appreciate the sound way in which Mr. Montgomery is conducting this eminently satisfactory enterprise. We trust he will also accord fire-prevention a place in his colliery exhibition, in respect to which it is likewise of primary importance.

SLOW - COMBUSTION CONSTRUCTION.



LONGITUDINAL SECTION OF TESTING CHAMBER.

In a previous supplement we had occasion to publish an interesting paper by Chief Officer Westphalen, of the Hamburg Fire Brigade, who was formerly a district surveyor of the Hanse city. The paper was illustrated by sections of warehouses erected in Hamburg in which the so-called slow-combustion construction was being used as distinct from the so-called fire-resisting construction.

Our attention has been called to the fact that whilst we have so far dealt in these supplements mainly with questions relating to fire-resisting construction, there is a very lage school who firmly believes in "slow combustion" construction for warehouse work rather than fire-resisting construction, and that we should call attention to some of the results of the British Fire Prevention Committee's tests in this direction, with systems of construction of a non-proprietary character, more particularly at a time when the questions relating to ferro-concrete are so much to the fore.

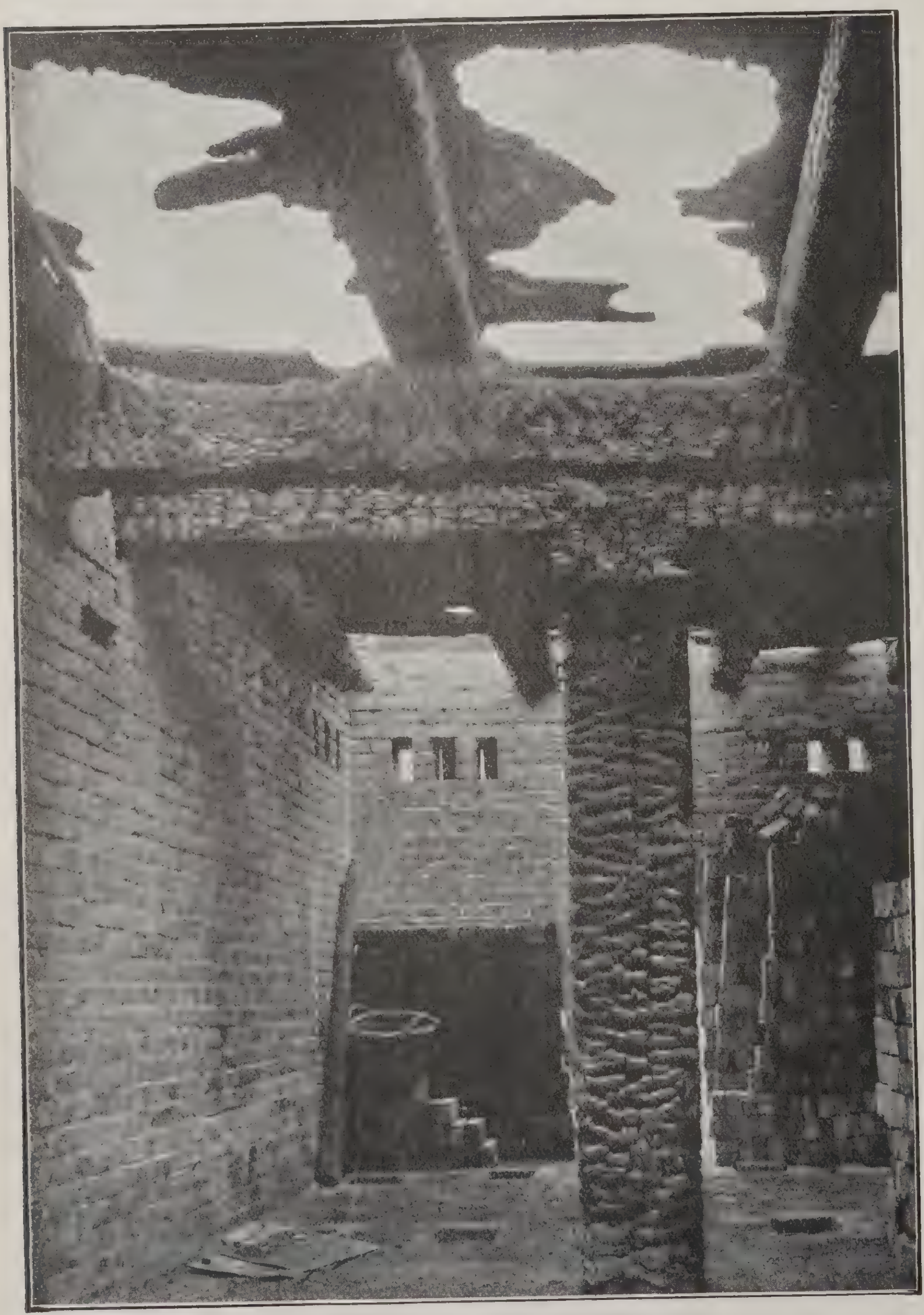
For this purpose we again reproduce a detailed section of a Hamburg warehouse, and in conjunction therewith the reproductions from the results of tests made with constructional timberwork of this kind, both with the common ordinary timber (fir and oak) and with Australian hardwood.

There can, of course, not be the slightest doubt that sound timber balks are splendid resisters of fire, and also that 3ins. of hardwood well jointed and carefully fixed affords considerable fire-resistance. Although not generally appreciated, it is of course well known to those primarily interested that the British Fire Prevention Committee have undertaken more tests with non-proprietary articles, *i.e.*, with materials and systems of construction in common every-day use, than with proprietary articles, *i.e.*, articles subject to patents or monopolies; and many hold that these tests with work of an ordinary character, not subject to any rights, are of a most far-reaching importance because they influence that wide circle of the building world which does not utilize specialist work.

Viewed with a section of the Hamburg work reproduced herewith, the result of two of these tests, reproduced herewith, should be most valuable, and it is for this reason that we are according them considerable space in the current supplement.

The two tests are each two-hour tests with floors constructed, in one case, of 2in. oak planking; in the other, of 2in. jarrah planking—in the first case supported by fir supports, in the latter by jarrah supports.

The object of the tests is taken from the official report, followed by a summary in each case explaining same. The diagrams explain the construction of the floors. If there is anything we would particularly like to call attention to in respect to the excellent illustrations we have produced, it is the remarkable manner in which the Australian wood chars as compared with ordinary fir, the difference in charring being most clearly shown in the photographs.



THE OAK FLOOR WITH FIR SUPPORTS AFTER THE TEST.

A Floor consisting of Fir Supports and Oak Flooring.

Object of the Test.—To record the effect of a fire of two hours' duration at a temperature gradually increasing up to 2,000° F.

Note.—The area of the floor under investigation to be 222ft. 6ins. super. in the clear (10ft. by 22ft. 3ins.). The floor was to be loaded with 232 lbs. per sq. ft., distributed as described.

Summary of Effect.—In four minutes smoke came from the joint between the parapet wall and oak flooring.

In eighty-nine minutes flame first appeared through the floor.

In 109 minutes a small portion of oak flooring fell and left the underside of bricks exposed. The post beams and joists were considerably reduced in size and charred, the post to a depth of about 1¼ins. and the beams and joists to a depth of about 2ins.

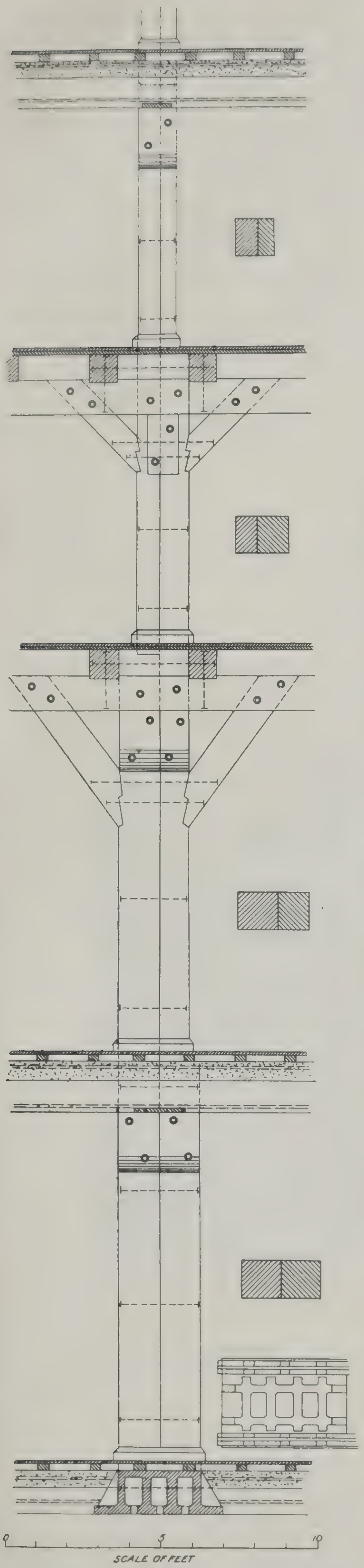
A Floor of Jarrah Supports and Flooring.

Object of the Test.—To record the effect of a fire of two hours' duration at a temperature gradually increasing up to 2,000° F.

Note.—The area of the floor under investigation to be 222ft. 6ins. super. in the clear (10ft. by 22ft. 3ins.). The floor was to be loaded with 232 lbs. per sq. ft., distributed as described.

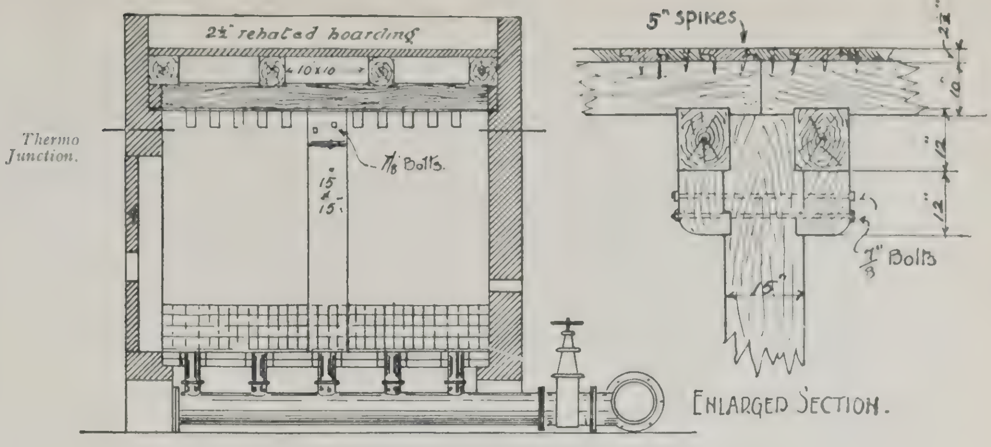
Summary of Effect.—In sixteen minutes some of the joints of the underside of the flooring were opening.

In seventeen minutes smoke appeared through a joint of the flooring.



WAREHOUSES AT HAMBURG: SECTION SHOWING SLOW-COMBUSTION TIMBER CONSTRUCTION.

(NOTE.—The 1st and 4th floors are pugged.)

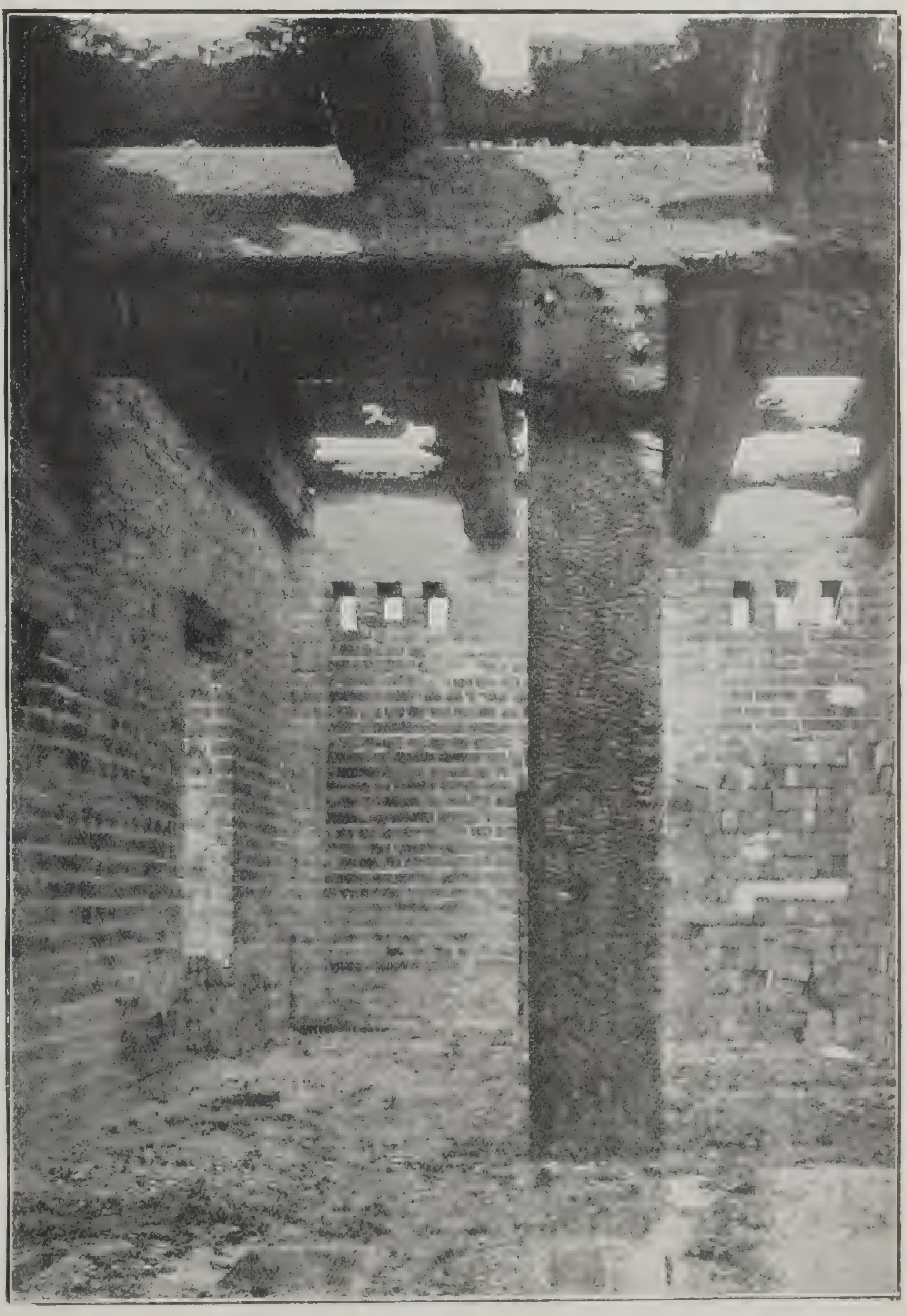


CROSS-SECTION OF TESTING CHAMBER.

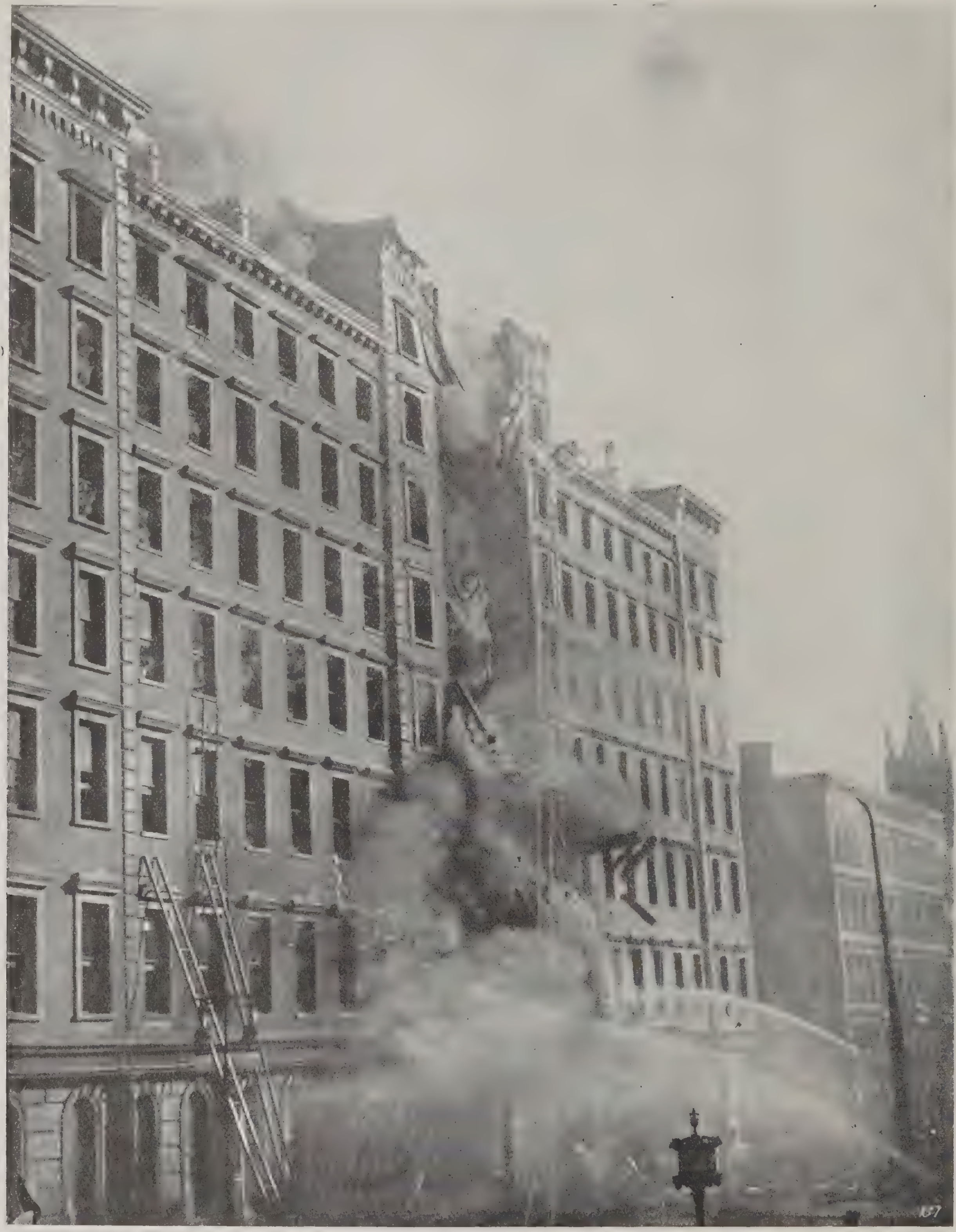
In sixty-nine minutes the underside of the flooring was burnt and flaked off, so that the rebated joints were visible in many places.

In eighty-four minutes flames came through the flooring.

In 119 minutes there were numerous holes in the floor, with flames coming through them, considerable portions of the flooring being burned away from under the stacks of bricks. The post, beams and joists were reduced in size and charred to a depth of ¾in.



THE JARRAH FLOOR AND SUPPORTS AFTER THE TEST.



THE WINDSOR HOTEL FIRE, NEW YORK: VIEW TAKEN WITHIN HALF AN HOUR OF THE ALARM BEING GIVEN.

HOTEL FIRES.

The Object-lesson of the Last Decade.

SO much hotel work is at present being done in the Metropolis that we think we should call attention, by way of reminder, to the disaster at the Windsor Hotel fire in New York in 1899. We do this advisedly, having regard to the nature of some of the hotels which are being put up; for whilst some of the new buildings show everything that modern knowledge can do, there is not the slightest doubt that others are of very inferior design and execution.

The Windsor Hotel fire occurred on the 17th of March, in the afternoon. At about 3 p.m. someone noticed a curl of smoke coming from an upper storey window, beneath the flag pole. The alarm of fire was at once given, reaching the nearest fire station at 3.15 p.m., and the first engines to respond were there in three minutes. Unfortunately a panic arose in the building, and although the rescue work was commenced immediately the result was nevertheless that about forty lives were lost.

The character of the building was that of an ordinary hotel building without fire-resisting floors, or, in other words, there was a very considerable amount of woodwork in the building, which dated from 1872. The rapidity of the fire was probably due to the very considerable extent to the lift shafts and small areas, to the length of the corridors, and the spaces left for pipes, wires, &c.

The photograph we show was taken within the first half hour of the fire. Within one hour the whole building had entirely collapsed, and within two hours there was nothing to be seen but a heap of ruins, of the character of an enormous rubbish heap.

Chief Officer of the Berlin Fire Brigade.—We have much pleasure in announcing the appointment of Mr. Reichel, late chief officer of the Hanover Fire Brigade, to be chief officer of the Berlin Royal Police Fire Brigade. Mr. Reichel is a civil engineer by profession, and he held the chair for fire-prevention at the Royal Technical College at Hanover. He is eminently suited to the post, as a man of great experience and scientific training.

FIRE RESISTANCE OF PARTITIONS.

THE impending enactments of the London Building Act have raised the question in many directions as to which of the partitions on the London market have already been examined as to their fire resistance under the official tests of the British Fire Prevention Committee; and as this question is certainly one of considerable importance we have compiled the following list, from which it will be seen that fourteen proprietary partitions or partition systems have been under investigation by this Committee.

It is interesting to observe that one proprietary firm put forward a partition of impregnated wood; two firms jointly, two partitions of wood filled in with slag wool; one firm a partition of metal supports with corrugated metal filling plastered both sides; two firms partitions in which metallic lathing forms an important feature; one firm a porous terra-cotta brick partition; one firm a sand-brick partition, whilst the remaining firms all dealt in slab partitions, the slabs being of various aggregates, the aggregates of late taking more the form of concrete aggregates in which pumice or other similar materials were a feature.

The list of partitions is given in order of rotation of tests, and at a future date we hope to publish a summary of the results of these tests for purposes of comparison. Some of the tests were naturally failures, whilst others were remarkably successful, but for the moment we would simply refer one to the official reports for further details. We are informed that a number of other partition tests will be undertaken in the course of this year:—

Two matchboarded partitions filled in with silicate cotton (slag wool) by Messrs. T. Anderson & Son, Ltd., and Messrs. T. Broadbent & Co., London. (Two tests.)

A partition of non-flammable deal by the Fire Resisting Corporation, Ltd., London.

A partition by the "Gypsine" Brick Co., Ltd., London.

A partition erected by the Mural and Decorations Syndicate, Ltd., London.

A partition formed with "Mack" patent slabs, and erected by M. J. A. King & Co., London.

Two partitions known as the "Cunnah-Wright" partition, by the Fireproof Partition Syndicate, Ltd., London. (Two tests.)

A partition erected by Banks' Helical Fireproofing System, Ltd., London.

A partition formed with "Phœnix" fire-resisting slabs, erected by Excelsior and Phœnix Partitions Co., Ltd.

A partition formed with Jabez Thompson's thin white partition slabs and erected by Jabez Thompson, Northwich, Cheshire.

A partition formed with Jabez Thompson's patent "Terrawode" brickwood and erected by Jabez Thompson, Northwich, Cheshire.

A partition formed with "Kulm" partition slabs and erected by Horace W. Cullum & Co., London.

A partition formed with Brunckhorst partition slabs and erected by H. Gust & Co., London. *Report not yet issued.*

Two partitions formed of thin "Mantada" slabs by the Adamant Co., Ltd., London and Birmingham. (Two tests.) *Reports not yet issued.*

A partition of asbestic bricks by the Asbestic Brick & Tile Co., Ltd. *Report not yet issued.*

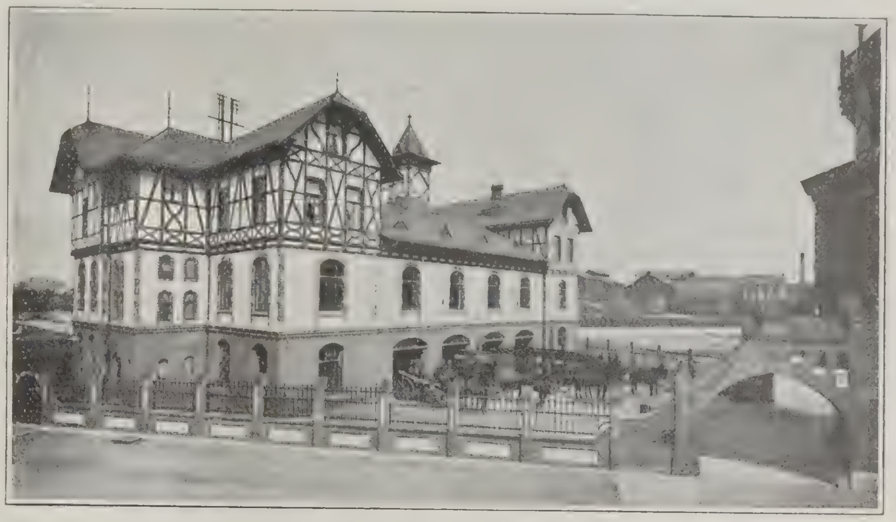
FIRE STATION AT BREMEN.

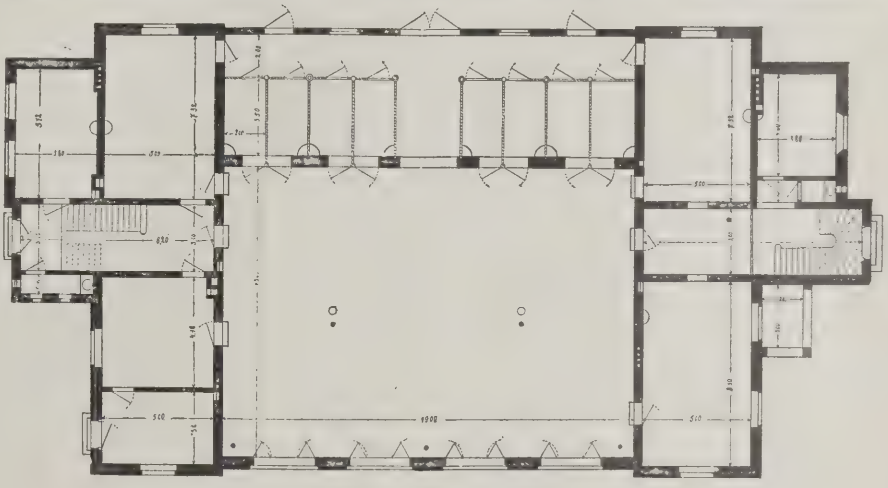
THE fire station at Bremen, here illustrated, is most carefully and effectively planned, and its architectural treatment is also above the average. The fire station is a district station planned so that four appliances can be housed with four pairs of horses. We give the ground-floor and basement plans; the dimensions will be seen figured on the plan on the metric system.

In this case the principle has been observed of putting the horses behind the fire-engines, and separating the stables from the engine-house by means of a solid wall fitted with doors, the doors opening automatically, allowing the horses to come out and get on each side of the appliances. There is a considerable economy in space in this building.

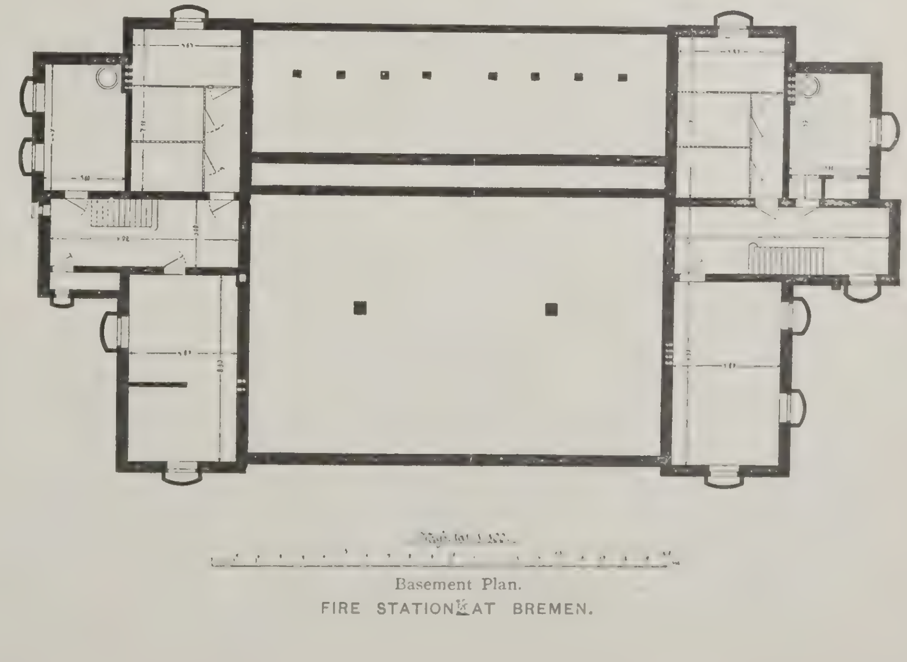
At the same time we take the opportunity of illustrating a drill and look-out tower which has been erected in connection with this fire-station. These towers are generally in the first place monstrosities, and in the second place are unreal and do not afford sufficient variety of conditions for the firemen's drill. In this instance, however, it will be seen that the drill tower shows a portion of the building with ordinary openings in it, another portion with balconies; there are cornices; there is some overhanging half-timber work, a projecting gallery, and a somewhat inaccessible turret. The photograph, by-the-bye, shows the firemen drilling with an 80ft. mechanically raised long ladder, with hook ladders, and with life lines. We think the drill tower in question might well merit the consideration of those entrusted with the design of fire-stations for municipal departments, and thus we reproduce some of the drawings, *i.e.*, a full set of plans, two elevations and a section to scale.

The Bremen brigade, by the way, is one of considerable efficiency and remarkable for its excellent management. It is commanded by Chief Officer Dittman, who is well known in this country and who has made a special hobby of fire-station design.]



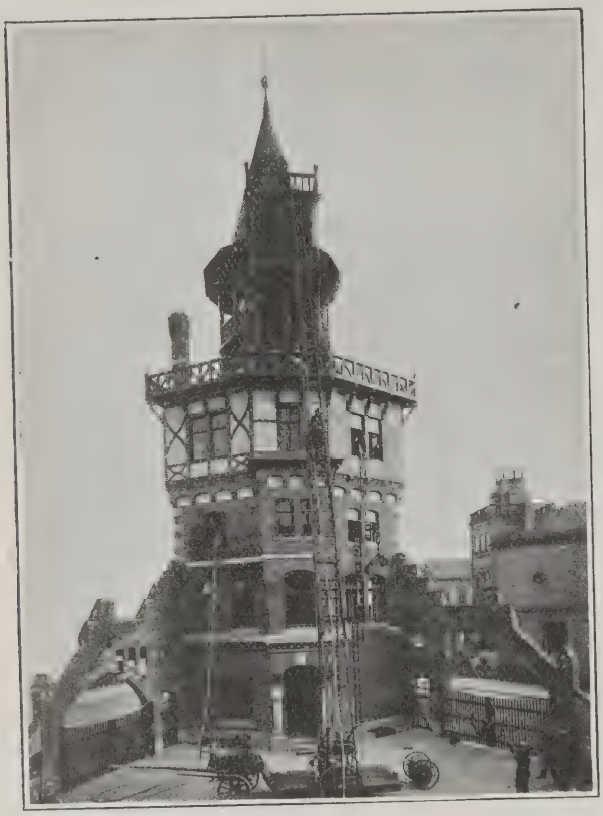


Ground-floor Plan.



Basement Plan.

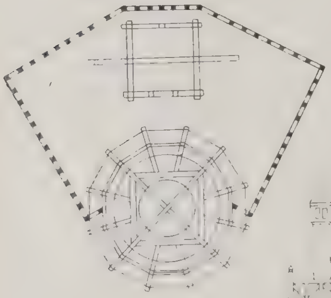
FIRE STATION AT BREMEN.



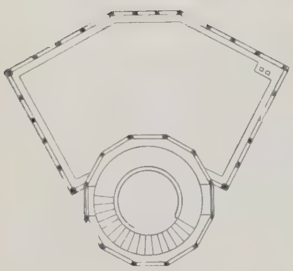
GLASGOW FIRE BRIGADE.

We observe the Glasgow Fire Brigade is to be materially improved by the addition of modern appliances. The city has been the subject of a number of serious fires of late, which its very efficient brigade has, however, been unable to limit to the extent one might have desired, owing not so much to any lack of suitable appliances as to the lack of legislation limiting the cubic contents of buildings.

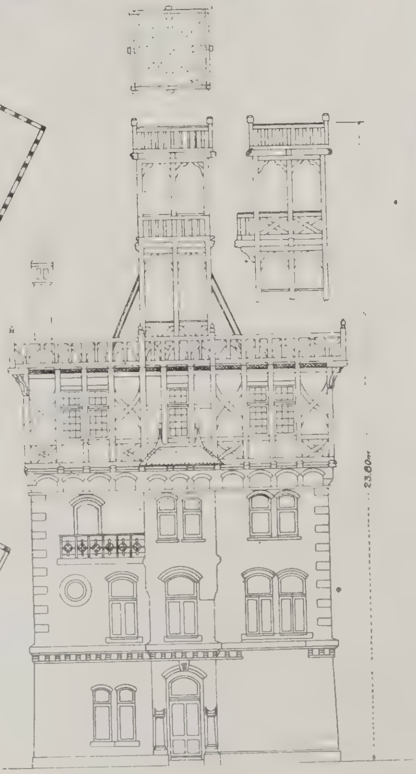
As to how the matter of additional appliances stands, the deputation representing the Glasgow Fire Brigade, which recently visited a number of cities in England to view the equipments of other brigades, has recently issued a report. The deputation recommends, among other appliances, the addition of a motor first-aid carriage and a motor fire-engine at an estimated cost of £1,500, and an extension fire escape with adjustable turntable at an approximate cost of £600. The points which most impressed the deputation were—(1) the unanimity of opinion of the various fire-brigade officials in regard to the advantages and superiority of motor-driven engines over horse haulage; (2) the utility of carrying on the first-aid machine a length of rubber hose with a small nozzle, the gain derived from it being a saving of time in its being used and the diminished water damage done; (3) the advisability of having in the equipment of the brigade an extension fire escape, in view of the increased height to which buildings are now being erected; and (4) the variety of smaller appliances at the disposal of the brigades of the cities visited being relatively greater than that provided in Glasgow.



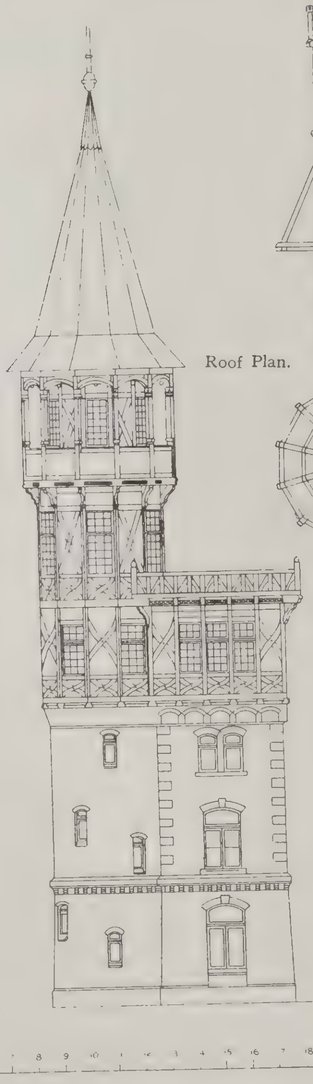
Fourth Floor.



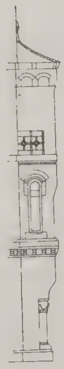
Third Floor.

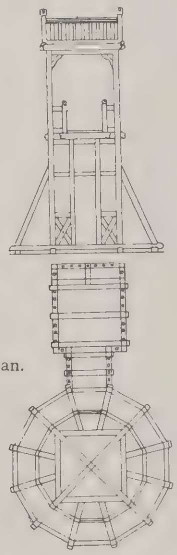


Elevation towards Drill Yard.



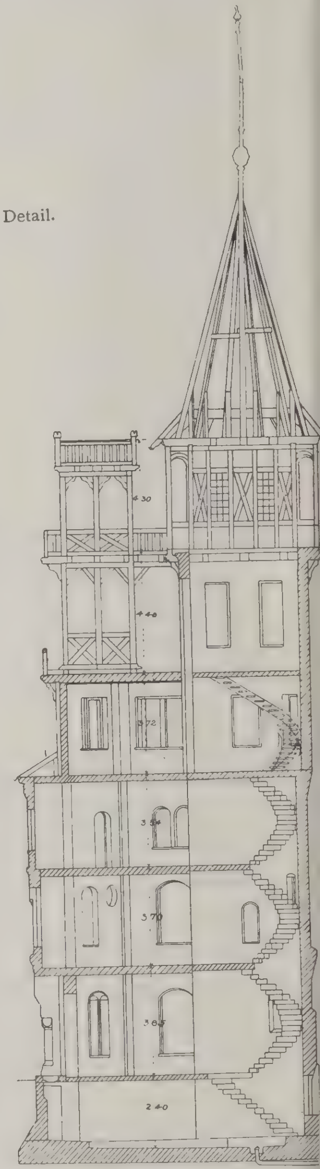
Elevation towards Street.



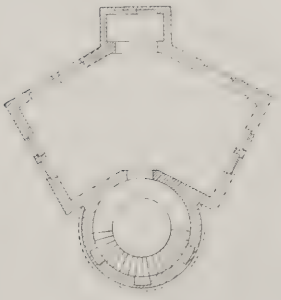


Detail.

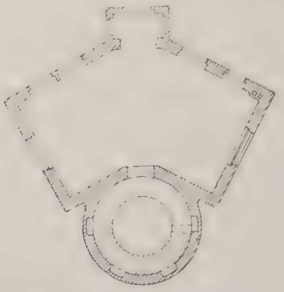
Roof Plan.



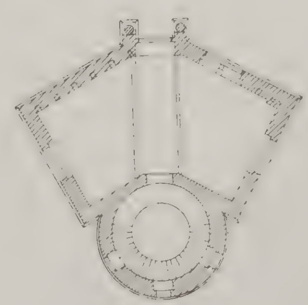
Section.



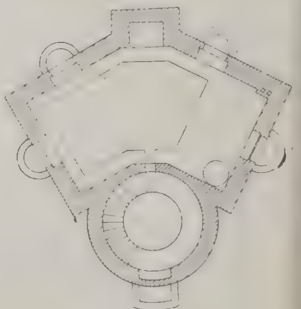
Second Floor.



First Floor.

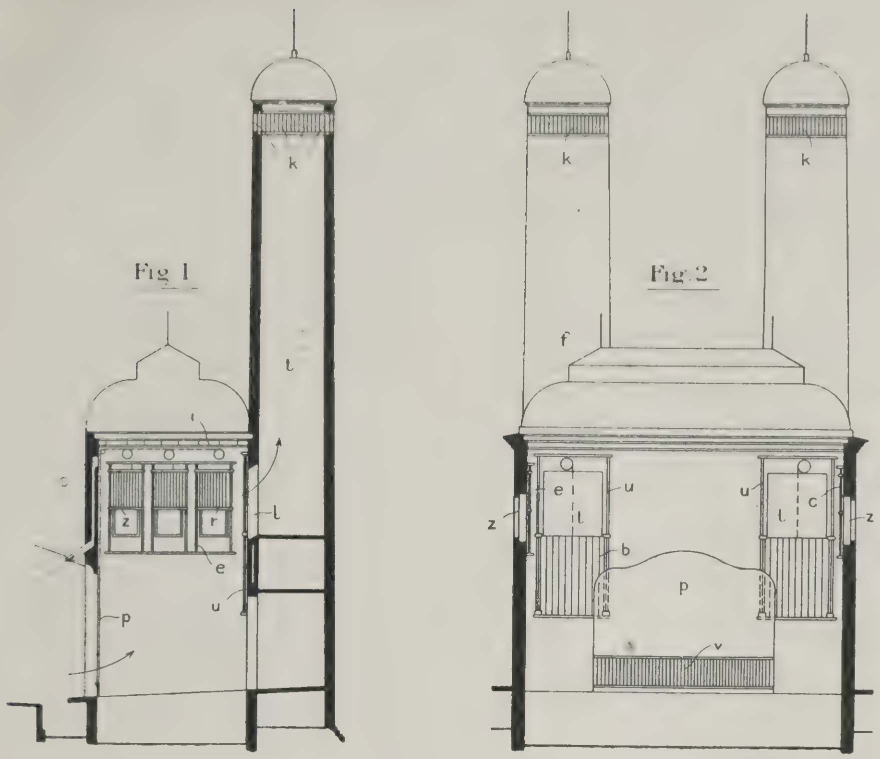


Ground Floor.



Basement.

DRILL AND LOOK-OUT TOWER AT A BREMEN FIRE STATION.



AN HUNGARIAN SCHEME FOR SPECIAL EXHAUST FLUES TO THEATRE STAGES.

THEATRE SAFETY.

We present several communications in this Fire Supplement appertaining to the safety of theatres from fire. The first is a paper by M. de Breuer, an officer of the Budapesth Fire Brigade, who deals mainly with a proposal for rapidly ventilating the stage on an outbreak of fire, and thus drawing off the smoke away from the auditorium. Another communication is one in respect to a second or auxiliary fire-resisting curtain which is being constructed from the design of Chief Officer Reichel. Lastly, we present some notes as to some fire-protective safeguards relating to Berlin theatres.

The whole question of safety in theatres and places of public entertainment from fire is so important that we think it merits the consideration of all architects, whose work lies in this direction, as also of the many surveyors attached to our public authorities.

SAFETY OF THEATRES FROM FIRE.

By Constans de Breuer, Budapest Fire Brigade.

The architect Mr. Koloman Rimanóczy, of Nagyvárad, in Hungary, has taken out a patent for a double theatre-curtain with a special construction to lead the smoke out of the building. This invention has been tried for the first time at a small experimental theatre which the inventor had put up in Nagyvárad. The experimental theatre consisted of an auditorium provided with doors at the sides and an upper window, and a stage 7 metres wide, 3 metres deep and 5·2 metres high (107 cub. metres volume). The stage was separated from the auditorium by an iron curtain, while the ceiling consisted of reinforced concrete. The curtain consisted of two iron-plates, each 3 metres wide by 2 metres high, which were placed at a distance of 16 millimetres from one another, with iron netting 40 centimetres high at the bottom. In the outer plate several small holes were made near the floor, while in the inner curtain such holes were bored near the top in such a way that between both plates an air draft circulated.

On the back part of the stage there was provided an opening of 1 sq. metre, connected to the chimney of the brick-yard alongside of which this experimental theatre had been put up. The inner area of the chimney was also 1 sq. metre.

For the 3,500 cub. metres large stage-room of the Nagyvárad theatre Mr. Rimanóczy projected two large openings (17·5 sq. metres), with iron doors, of which each one would end in a tower-shaped chimney. From the auditorium the consumed air as well as the smoke produced there would be conducted into ventilation shafts provided in the proscenium wall and ending at the dressing-floors. The windows of these floors, although provided with iron doors, could be opened for ventilation.

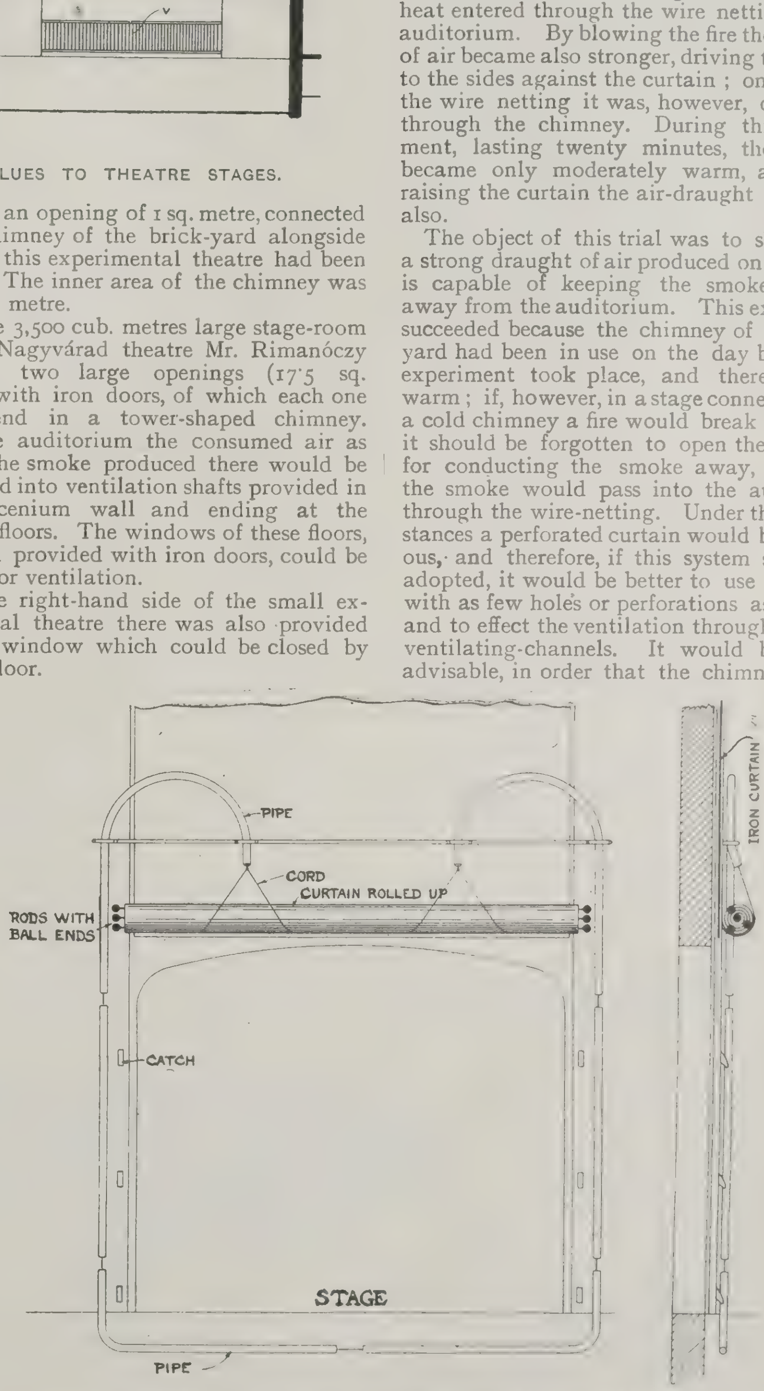
On the right-hand side of the small experimental theatre there was also provided a small window which could be closed by an iron door.

At the experimental test a light wooden frame was fixed around the stage and reeds and wood-shavings placed thereon. After kindling these shavings the iron curtain was lowered. The draught of air passing from the auditorium to the stage was so strong that some of the shavings were blown from their places, so that the fire hardly spread. After five minutes only half of the frame was burning, while the smoke was nearly entirely drawn away up the chimney; after seven minutes the doors of the auditorium were closed, whereupon the fire as well as the generation of smoke became more lively. After nine minutes the side-windows were opened; this, however, had no influence on the draught of the air. After twelve minutes the fire went out, although not even the whole of the reeds had been consumed by the fire, while the iron curtain was only moderately wärm.

When the curtain was raised most of the smoke entered the auditorium, but it descended only as far as the wire-netting of the curtain.

At the second trial we lit a basket containing wet straw and wood-shavings placed near the curtain on the stage, whereupon the heat entered through the wire netting to the auditorium. By blowing the fire the draught of air became also stronger, driving the smoke to the sides against the curtain; on entering the wire netting it was, however, drawn off through the chimney. During this experiment, lasting twenty minutes, the curtain became only moderately warm, and after raising the curtain the air-draught decreased also.

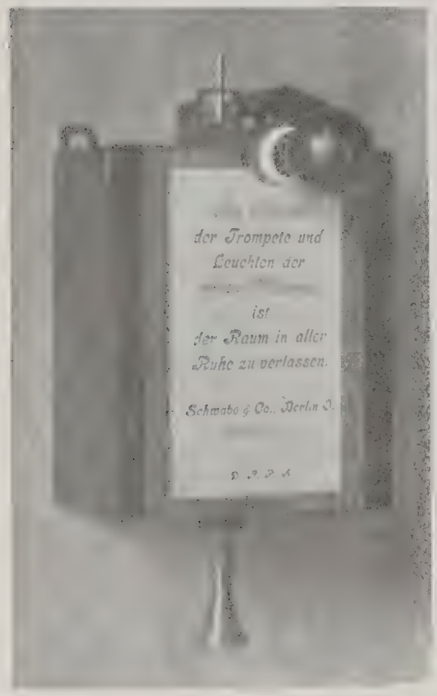
The object of this trial was to show that a strong draught of air produced on the stage is capable of keeping the smoke entirely away from the auditorium. This experiment succeeded because the chimney of the brick-yard had been in use on the day before the experiment took place, and therefore was warm; if, however, in a stage connected with a cold chimney a fire would break out, or if it should be forgotten to open the openings for conducting the smoke away, doubtless the smoke would pass into the auditorium through the wire-netting. Under the circumstances a perforated curtain would be dangerous, and therefore, if this system should be adopted, it would be better to use a curtain with as few holes or perforations as possible and to effect the ventilation through separate ventilating-channels. It would be further advisable, in order that the chimney should



CHIEF OFFICER REICHEL'S AUXILIARY CLOTH FIRE-RESISTING SCREEN FOR THEATRE PROSCENIUM OPENINGS.

always be warm, not to lead the ventilation channels from the auditorium to the dressing-floor, but to the chimney, as in this way the warm air in the auditorium would suffice for keeping the chimney moderately warm, and in this way a continuous draught of air would be created, which, if the smoke-discharge openings were open, would take away the smoke.

The system of Mr. Rimanóczy is theoretically quite good. Generally it might be said that this system would work satisfactorily only if the air-draught produced is strong enough to overcome the expansion of the smoke-gases, and if the chimney is capable of leading this large quantity of smoke away—otherwise the whole smoke would be forced into the auditorium. A further drawback to this system is that it requires the building of a large chimney.



HOOTER AND SIGNAL LIGHT FOR THE BERLIN THEATRES.

The principle of this system, *i.e.*, to conduct the smoke away from the auditorium, is sound; and it is very surprising, that at almost all theatres just the opposite has been done. The opening above the great lustre, as well as the doors and windows in the galleries, has, probably speaking, only the object of conducting the smoke away in case of fire, but this is done in such a way that it is carried right into the faces of the public instead of drawing it away from them.

Ventilation openings of suitable size, or provided with sufficiently strong exhausters, should be provided next to the proscenium wall in order that the smoke may be drawn to this part and discharged through the upper part of the building.

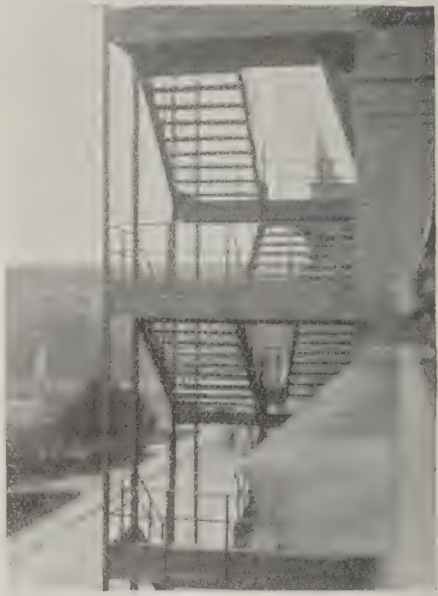
Especially objectionable is the roof construction of the modern theatres, as the ceiling of the uppermost gallery is often situated higher than the opening above the great lustre. The smoke produced cannot pass this narrow opening and, after first filling the space under the main ceiling, penetrates these more loftily situated large compartments and thereby renders the escape of the public through the upper doors almost an impossibility, as the smoke would here accumulate before the public could reach them.

AN EMERGENCY CURTAIN.

Herr Reichel, the chief of the Hanover fire department, has invented an emergency fire-curtain for theatres that are already provided with an iron drop-curtain. The object of this second or emergency curtain is to provide protection for the spectators in case a fire breaks out on or back of the stage and the regular iron curtain fails to work, as happened in the Iroquois disaster in Chicago. The "emergency" curtain can also be used to supplement the regular fire-curtain and accord additional protection, if only temporary. The main thing for it to accomplish is to prevent the flames and smoke from penetrating into the auditorium until the spectators escape.

The illustration on the preceding page shows the arrangement. The emergency curtain is attached to or combined with a system of vertical wire cords and stout horizontal iron rods. The curtain bears no part of the weight of the horizontal rods, as these are independently carried by the wire cords, which are attached to the upper and the lower curtain rollers and rolled-up with the curtain itself. There are about five of these wire cords to support the rods for an ordinary stage-opening width. At each end of each iron rod there is a metal ball. When the curtain is lowered, either slowly or rapidly, these balls engage in the catches so that, although there might be a strong draught from the stage towards the auditorium, it would not be able to blow the curtain out into the latter space or even belly it outward. As these rods could be only in tension when thus resisting the draught from the stage outward, they need not be of very great diameter. The curved pipe-line through which is led the endless cord that holds up the curtain has in its length several gaps at convenient places; and by each of them there is chained a stout, sharp knife with which to cut the cord in case of fire. Of course cutting the cord at any one point suffices to let the curtain (and with it, naturally, the cross-rods) down with a run, covering the entire stage opening from within and effectually cutting off communication of smoke or flame between stage and auditorium. There is no complication about the device. If the cord is cut anywhere in its length the curtain must be released; the weight of the lower roller, together with that of the curtain, suffices. The curtain is rolled up by the use of inclined ladders, boards or poles, as may be convenient.

There is naturally nothing to prevent the cords and the curtain from being tested monthly, or even weekly, if desired; there is only the trouble of running the corp through the tube line, an affair of about fifteen minutes.



OUTSIDE THE ESCAPE STAIRCASE AT THE BERLIN OPERA HOUSE.

PRECAUTIONS AT BERLIN THEATRES.

Among the numerous precautions being taken at the theatres at Berlin we note the installation of a somewhat novel appliance intended to warn the audience of danger. This is a kind of combined hooter that shows a red light. The illustration presented explains the appliance. A notice is printed informing the public that they have to leave the theatre when the hooter sounds.

Another feature of the precautionary measures at Berlin is the wholesale application of outside staircases irrespective of their inartistic appearance. We illustrate one of these staircases as applied to the Opera House at Berlin, which is a structure of architectural pretensions in Renaissance style.

We certainly do not think much of the idea of the hooter, though some form of signal, such as a red lamp, if unaccompanied by any noise for giving warning to the attendants might be valuable.

As to the outside staircases at Berlin, they are very useful, but we doubt if it is advisable to overdo their application as at the Opera House.

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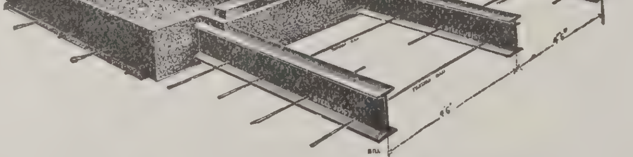

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THE

BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

May 17, 1905. Vol. 21, No. 536.

6, Great New Street, Fetter Lane, E.C.

Summary.

The four chimneys at the "underground" power station at Chelsea are each 275ft. high and 19ft. in diameter, built of perforated bricks. At Mill Hill Park car-sheds more than 800ft. long have been erected. (Page 277.)

The greater the weight in the upper part of a dome the greater will be the horizontal thrust: therefore a dome requires less thickness and is more stable when an eye is formed in the top. Pointed domes are more stable than spherical ones, and this form should be used when a lantern has to be supported on the top. (Page 272.)

The new pier at Falmouth has been completed after two years' work. It is largely constructed of reinforced concrete on the Hennebique system. (Page 281.)

The new Gaiety Restaurant and Hotel was opened last Wednesday. (Page 281.)

The Coventry City Council has decided to make no alteration in the practice of architectural work being carried out by its officials. (Page 281.)

The R.I.B.A. council elections will be decided again on the registration question. (Page 279.)

Mr. W. A. Pite has won the competition for the new King's College Hospital to be built at Camberwell, and Messrs. Warwick & Hall have been placed first in the competition for new municipal buildings at Lambeth. (Page 282.)

A well-preserved length of London's Roman wall has been found in Jewry Street, Aldgate. (Page 281.)

Papers on sculpture and architecture were read before the R.I.B.A. on Monday evening by Mr. T. Stirling Lee and Mr. W. Reynolds Stephens. (Page 282.)

The L.C.C. Bill for the preservation of London squares has been rejected by a Select Committee of the House of Lords. (Page 282.)

In the United States a man named Farley has a regularly organized business for fighting a strike. On his books he has as many as 40,000 names, and he can always call up 1,000 men at a moment's notice. (This page.)

The Royal Sanitary Institute propose to move to larger premises. Towards the expense £10,000 is in hand, and £15,000 more is wanted. (Page 282.)

The Bill for amending the Public Health Acts, so as to secure more reasonable by-laws for rural districts, has passed its second reading in the House of Lords. (This page.)

A Point to Remember. We desire to remind our readers just now of the fable of the old man and the donkey, because from some quarters we have received grumbling criticism of our Fire Supplement and the policy of representing constructional work in progress. It is, of course, impossible to please everyone; one reader likes this and another that; one architect, who designs hotels and business premises, will turn with the greatest interest to our photographs showing the erection of the Ritz Hotel, for instance, while another architect, who builds houses far away in the country, may perhaps find nothing attractive in such illustrations. These varied interests we ask our readers to bear in mind. In the architectural and building world the policy of running a paper for any particular class or clique has never succeeded. The numerous interests have all to be represented, and—what is of paramount importance—special attention has to be given to the future. It has long been recognized that the study of the architectural past only, leads to lifelessness. Nowadays we see a reversion of the old ideas, and one expression of the change may be found in the general practice of visiting new buildings in course of construction. With that fact in view, we are devoting special attention to the representation of such work by photographs and drawings; while, as to the Fire Supplement, we may say that it deals with what is more and more becoming a necessity—fire-resisting construction—and should therefore interest all architects and builders. To those who are so fossilized as to have little taste for such affairs we would point out that the Supplement is added to this Journal without any extra charge, and is something quite extra to our ordinary issue, and it can be read or not according to the particular taste of each reader.

Fighting a Strike. Some particulars of Mr. James Farley, the "strike breaker," who has been called in to settle the teamsters' strike in Chicago, have been furnished by an American correspondent of the "Times." This worthy generals the forces of "blacklegs" for the masters just as the Union "boss" generals the forces of labour against capital. His record is an amazing one. He has broken a number of huge strikes all over the United States. He has made it his business for the last five years to keep in touch with men who were ready to work for employers suddenly left without employees, and it is stated that he has on his list nearly 40,000 names. Not all who are enrolled in his army are immediately available, as many may happen at any particular time to be in situations which they would not care to throw up, but there are at least 1,000 who can be called upon at a moment's notice, and several thousands besides can be mobilized within a few days. In accordance with the rules of this warfare, this general does not ride at the head of his men, but directs operations over the wire from a secluded office. As long as a strike lasts Farley is absolute despot, not even the capitalists venturing to interfere with his plans nor to offer a suggestion, for he is no subordinate or adviser, but contracts to break a strike. In this "one-horse country" we have not as yet anyone who has taken up this new profession, nor have we the armed private bodies of detectives that apply their persuasion to the settlement of a dispute. But then we are not a democratic and free republic.

Rural By-laws. The Public Health Acts (Amendment) Bill was read a second time in the House of Lords last Thursday, and referred to a Select Committee. The provisions of this Bill are briefly as follows:—

Clause 1 enacts that the Act shall be construed with the Public Health Acts and apply co-extensively with them.

Clause 2 exempts any building (except a public building or a factory over one storey in height or with a gallery) from the operation of any existing or future by-law within any "county district" with respect to the structure of walls, foundations, roofs, floors, chimneys or hearths, space about buildings, ventilation, giving of notices or deposit of plans or sections, provided it is situated 15ft. from the boundaries of the curtilage thereof or from the centre of a street—or if the height of the building to the spring of the roof exceeds 15ft. the distance from the boundaries or street must be extended equal to such height. The distance from any other building must be not less than 30ft., but a stable or offices of a detached house are exempted. Two dwelling-houses separated by a party division of fire-resisting material are deemed to be a single building.

Clause 3 provides that if alterations are made in a building that diminish the space about it, the exemption shall cease to apply.

Clause 4 provides that nothing in this Act shall exempt any building from the operation of any by-law with respect to the drainage of buildings or with respect to water-closets, earth-closets, privies, ashpits or cesspools in connection therewith.

Clause 5 empowers the Local Government Board, upon the representation of five ratepayers, to disallow by-laws after confirmation where any such are found unsuited to the district in respect to which they apply or to operate contrary to the public interests.

While we think the Bill is a step in the right direction, and should help to settle the housing problem in rural districts, it requires careful consideration in Committee. Clause 2 is on the whole reasonable, but if it is admitted that two attached houses ought to be exempted, then equally so ought a block of eight, six, or four at least, which would be safe, better to drain, and economical. It would be right, of course, then to insist upon a greater space about the buildings. Means of escape from fire in buildings more than two storeys high surely require regulation as much as sanitation. It is doubtful if clause 5 will become law, though it would be a great benefit, for there ought to be some appeal against unreasonable restrictions.

THE CONSTRUCTION OF A STONE DOME.*

By JAMES S. BOYD.

THE construction of a stone dome is of great interest to the architect and to the craftsman: to the former because the study of masonry is of value both from an artistic and a constructive point of view, while to the latter its practical importance is self-evident.

The dome as an architectural feature is not here under consideration, nor is it proposed to go into the matter of the theory of dome construction.

The treatment of the subject will be confined to the constructional and more practical part of the work connected with a dome of moderate size, as well as the principles of stone dome construction.

Principles.

A dome may be generally described as a spherical roof rising like an inverted cup over a circular or polygonal base.

If we cut a spherical dome by four vertical planes equidistant from the centre and at right angles to each other, the spandrel portions of the dome contained between the plane surfaces are called pendentives, and this is the proper form of a pendentive dome (see Fig. 4).

When a spherical dome covers a square compartment of a building (such as is shown in Figs. 1, 2 and 3) it requires some means of support for the whole of its base. This is usually provided by corbelling out a pendentive from the internal angle of each pier to meet the base of the dome: and all domes of this nature are commonly styled "pendentive" domes.

The outward thrust of a dome near its base requiring to be counteracted, it is usual to add mass on the outer surface just above the springing to do this (Fig. 5). This mass counteracts the outward pressure of the dome near its base, directing it into a more vertical direction. Metal ties embedded in the masonry near the base of the dome serve the same purpose.

If a dome is hemispherical in form, with a proper thickness of material and without a lantern on the top, the ties need not be used in any bed joint making a greater angle than 23 degs. to the horizontal base (Fig. 1), because this has been proved to be the inclination of the weakest joint in a hemispherical dome, and all the stones above this angle press inwards, each circular course forming a horizontal arch keying itself.

The dome is therefore independent of a keystone.

Copper cramps from 10ins. to 12ins. long have been used to tie the stones of a lower course together. They are inserted in the upper bed of the stone, but the objection to the use of cramps is that each stone in this course is brought into tension.

A much better arrangement is to have a continuous ring of iron or copper sunk into the bed of the stone (Figs. 6 and 7), which method is quite suitable for a dome of moderate span.

Whether the ring or cramps be used, they should be properly embedded in Portland cement.

The cement used in building the dome may help a great deal, as it also acts as a tie to a certain extent, depending on the tensile strength of the cement used.

It has been found that the weakest joint in a dome of a pointed form makes a much smaller angle than 23 degs. with the horizontal.

A stone dome need not be uniform in thickness throughout, for, if reduced gradually towards the crown, it can do with less material (Fig. 1).

If the reduction at the crown is such that it is half the thickness at the base, the weight is then only little more than half of that required for a dome of uniform thickness and of the same size.

The greater the weight in the upper part of the dome, the greater will be the horizontal thrust. Therefore a dome requires less thickness and is more stable when an eye is formed in the top.

When circular openings are cut through the lower part, the stability is greatly diminished, both by the loss in weight and by the reduction of the base area of the dome.

Any increase in weight at the top (such as adding a lantern) will decrease the stability in a much higher ratio than the weight cut out near the base.

Pointed domes are more stable than spherical ones, and this form should be used when a lantern has to be supported on the top.

It is now my intention to deal with the setting-out of the dome as required in actual practice, and then to describe the working of the stones in it, after which the work connected with the pendentives will be taken up.

Setting-out of the Dome full size.

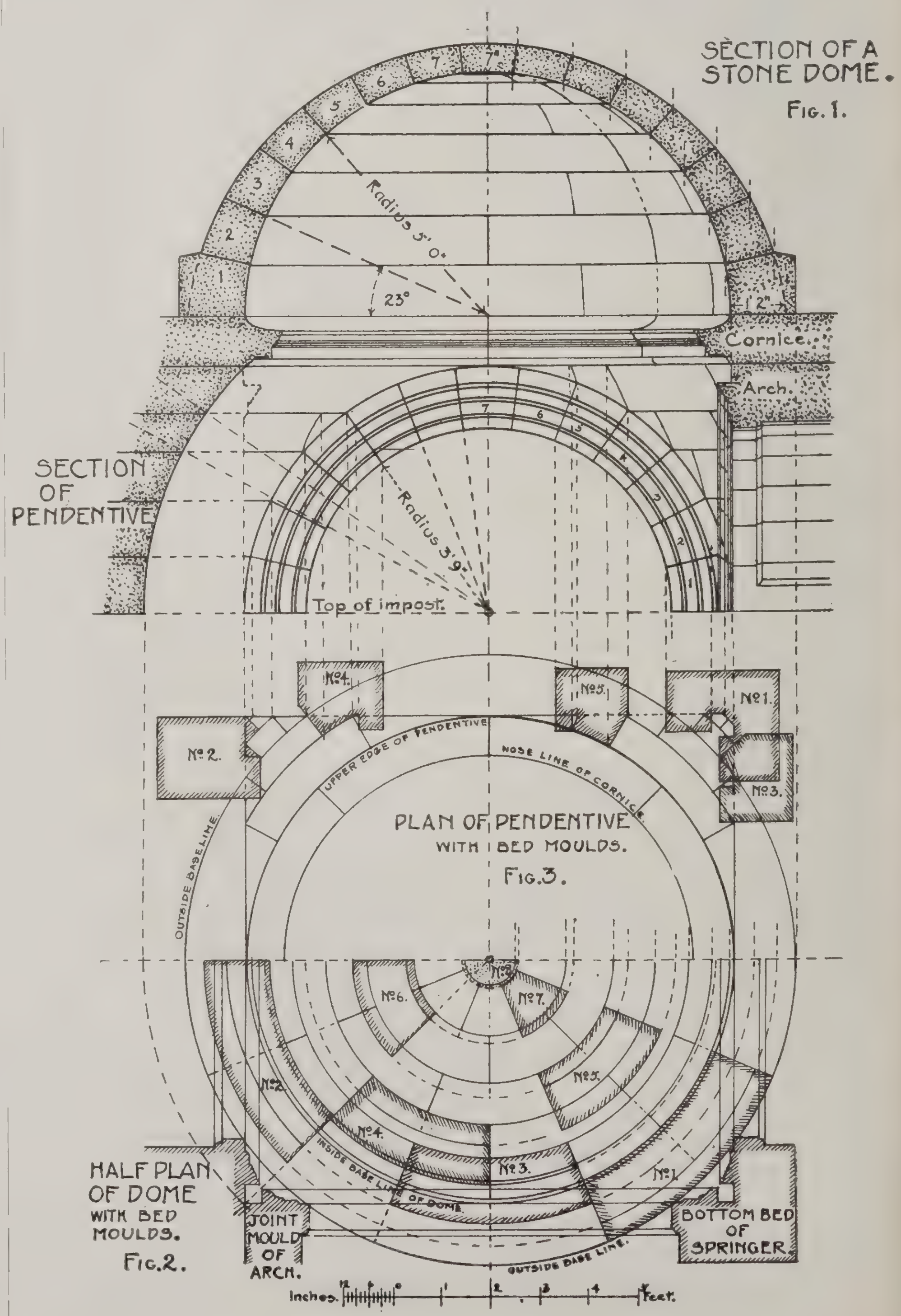
All the bed moulds could be developed from a quarter plan drawn down full size, but in order to show the "setting out" clearly, a half plan looking up (Fig. 2) has been drawn.

The lines of the joints on plan are very easily traced if the soffit joints are shown in solid lines and the extrados joints dotted.

The bed moulds are here shown longer than would be used, so as to avoid confusion of the lines, but whatever length of stone is fixed upon, each stone should, if possible, be of the same length in that course, because the bed mould will then give the exact length of each stone in the course.

Before the plan can be drawn complete, at least one-half of the section (Fig. 1) would be required. The section gives all the joint moulds necessary (one for each course).

The thickness of the joints should be deducted when the moulds are cut, and the moulds should be made of stout zinc.



SECTION OF A STONE DOME. FIG. 1.

PLAN OF PENDENTIVE WITH BED MOULDS. FIG. 3.

HALF PLAN OF DOME WITH BED MOULDS. FIG. 2.

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* A paper read before the Glasgow and West of Scotland Technical College Architectural Craftsmen's Society.

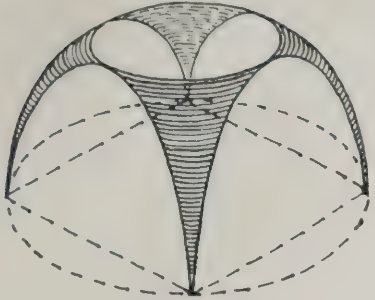


FIG. 4

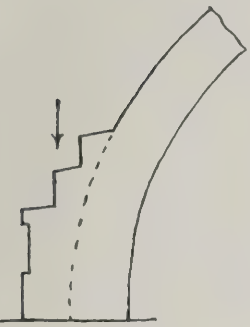


FIG. 5

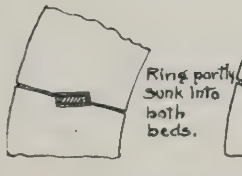


FIG. 6

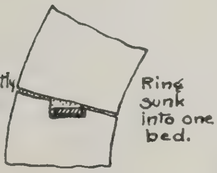


FIG. 7

There is some difference of opinion as to the most economical method of working the stones for a dome. In regard to simplicity, the method about to be described is the most suitable, especially for the lower and higher courses, and may also be adopted for the other courses, but with these there is greater waste of material.

The saving in material effected by any more intricate method will not compensate for the loss of time involved in the work.

The working of a Stone in Course No. 1.

The form of the block required for working any of the stones is a rectangular prism; the length equal to the full length of the bed mould, as in Fig. 8, and the full height of the joint mould for that course, as in the section (Fig. 1).

First, work the bottom bed and scribe in the bed mould (Fig. 8). The inner arris line on this bed may be marked by a pencil through small perforations formed in the mould, or it may be scribed in with a templet taken from the corresponding arris line on plan.

Next, work the vertical joints to the end of the bed mould square from the bed, as in Fig. 9. Square up lines on each joint from the arris lines on the bed. These lines guide the application of the joint mould which is now scribed on each joint. A top bed is now worked parallel to the bottom bed and to the exact height of the joint mould. This bed is only a surface of operation, and labour need not be thrown away on it where it is not required.

It may be mentioned here that the stones for each course can be machined down to a gauge x (Fig. 9), the exact height of each joint mould, and this is a great saving in labour, but in each example described here it is assumed that the stones are entirely worked by hand labour.

Next, apply the bed mould on this bed and scribe in the lines required (Fig. 10).

A draft is sunk at the lower arris of the splay joint; the templet used for this is taken from the corresponding arris line on the bed mould on plan.

Roughly square down the small part of the stone directly above the draft to the inner arris line drawn on the top bed (Fig. 10). This arris can now be trammelled in from the top bed.

We next work off the conical splayed bed, drafts radiating from the centre of the dome being sunk between the outer and inner arrises by the aid of a short straight-edge (see Fig. 11).

In Fig. 1 the back of the springer course is shown vertical, but if the back has to be cut to the extrados curve, it can now be worked off guided by a templet (Fig. 12) taken from the extrados curve in the section (Fig. 1).

The soffit can also be worked out by sinking drafts to a templet taken from the soffit curve in section (Fig. 1).

In each case, when templets are used, they should be held plumb and radiating to the centre of the plan.

The working of a Stone in Course No. 3.

The shape of the rough block required for this stone is also a rectangular prism; length equal to that of bed mould and height equal to that of joint mould.

The stones may be gauged down to the height x in Fig. 14 by a planing machine, as already mentioned, or we may begin by working a bottom bed by hand, on which scribe in the bed mould (Fig. 13). All that is left of this bed when the stone is finished is the lower arris, so that labour may be saved on the bed where possible. The vertical joints can now be cut square from the bed, and the joint mould accurately applied and scribed on the joints, as in Fig. 14. The stone is now brought to a parallel thickness by working the top operation bed to the height of the joint mould.

Apply the bed mould on this bed, and scribe in the lines required (see Fig. 15).

A draft is next sunk to contain the upper inside arris by the aid of a templet taken from that arris line on the plan or from the bed mould. Trammel in the arris from the top bed, as in the first stone, and clean out the splay bed guided by the short straight-edge.

To work off the bottom splayed joint, take a templet to the bottom outer arris curve on plan, and sink a draft to contain the arris, which is now trammelled on from the bottom bed (Fig. 16). The splay is now worked off, aided by the straight-edge.

Lastly, clean out the soffit and the back as explained in connection with stone No. 1. As an alternative method, the soffit may be cleaned after the top splay joint has been worked by means of the soffit templet; then the bottom splay joint may be worked by an arch bevel applied from the soffit, as in Fig. 17.

As already stated, when this method is applied to the middle courses of the dome, it involves a great loss of stone, as we can see by comparing the finished block (Fig. 17) with the rough block (Fig. 14).

In order to save material, the stone can be worked as a polygonal prism, as in Fig. 23.

To obtain the moulds, a sectional elevation of one block is drawn on a vertical plane passing through the centre of the block and centre of dome (Figs. 18 and 19). The stone prism (the base of which is the polygon F′ B′ E′ K′ P′ Q′ in elevation) is worked straight through, as in Fig. 23.

Measure the distances J E, M F and R B from the base of the prism, shown on the plan of the block (Fig. 19). These give four points which will enable the vertical joint to be worked at this end of the block.

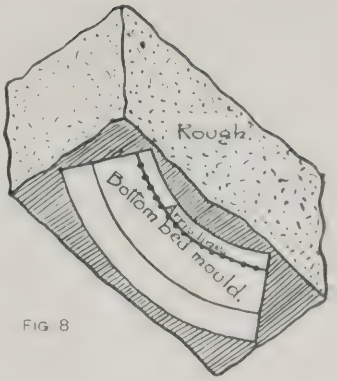


FIG 8

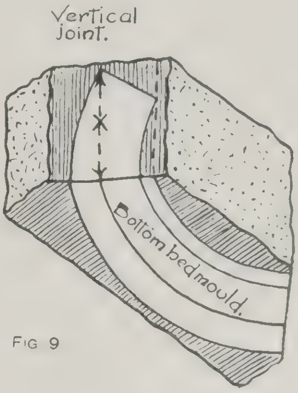


FIG 9

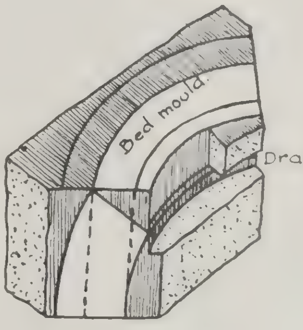


FIG 10

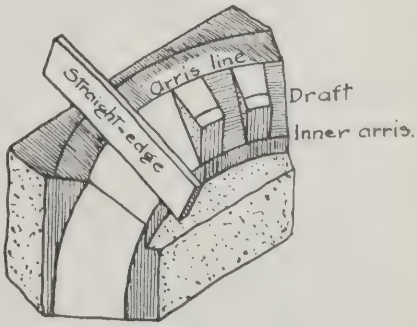


FIG 11

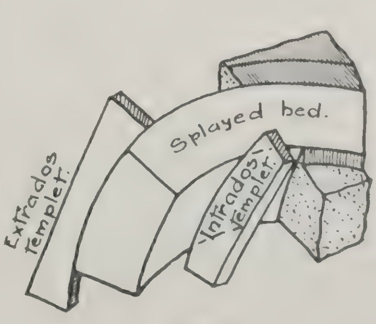


FIG. 12

On the top bed, Q F of Fig. 23, the topmost arris is scribed in, using a templet to this arris, F G on the plan. A mould of the inner

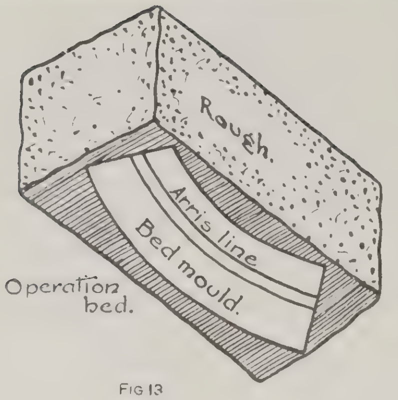


Fig 13

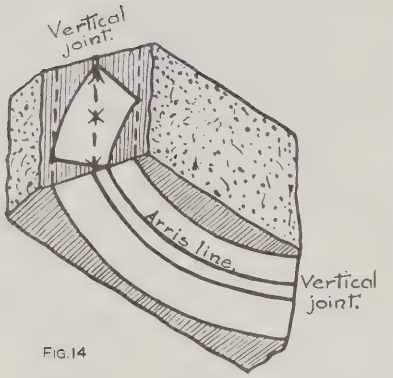


Fig. 14

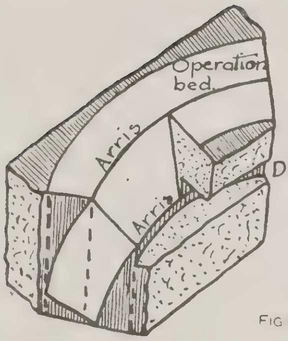


Fig 15

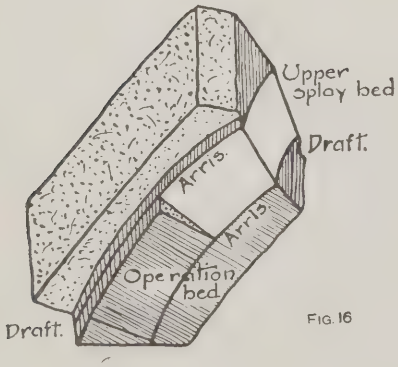


Fig. 16

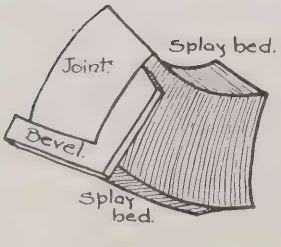


Fig. 17

operation plane is developed, as shown in Fig. 21, and with this mould draw on the inner surface of the prism its intersection by the conical surface of the upper splay bed (Fig. 24). The upper conical bed can now be worked through to the two curves just drawn, the straight-edge used always held radiating to the centre of the dome.

The lower bed can be worked in a similar manner. The bottom arris line is drawn on the bottom bed of the prism, as in Fig. 24, with a templet to E K H on plan (Fig. 19).

Develop an outside operation plane mould, as in Fig. 20, and with this draw on the outer surface its intersection with the bottom conical joint (see Fig. 23). The bottom conical bed is now worked to the two curves, aided by the straight-edge, as already explained (see Fig. 25).

Flexible moulds of the upper and lower beds are developed as shown in Fig. 22. The moulds are pressed into and around the conical surface, to scribe in the interior arris of the upper splay bed and the exterior arris of the bottom splay bed (Fig. 25).

Guided by templets taken from the soffit and extrados curves, the spherical surfaces are now worked (see Fig. 26), a joint mould being scribed on the vertical joints as indicated.

The pendentive has already been defined.

The arrangement of the bed joints is worthy of some attention. These are much better if worked as conical or splay beds as in the dome, but as this requires more material and causes more trouble in working, they are generally horizontal, as shown in the section (Fig. 1).

Sometimes the lower courses only are worked with level beds, and the higher courses with splayed beds, as indicated by dotted lines in the section.

Observe also in the same figure that the courses are arranged to suit the stones in the arches, and a haunch is worked on each arch stone, which thereby forms a good bond with the pendentive.

The bonding of the two together in this way is often omitted, the pendentive courses being simply splayed on the back of the arch with a plain joint.

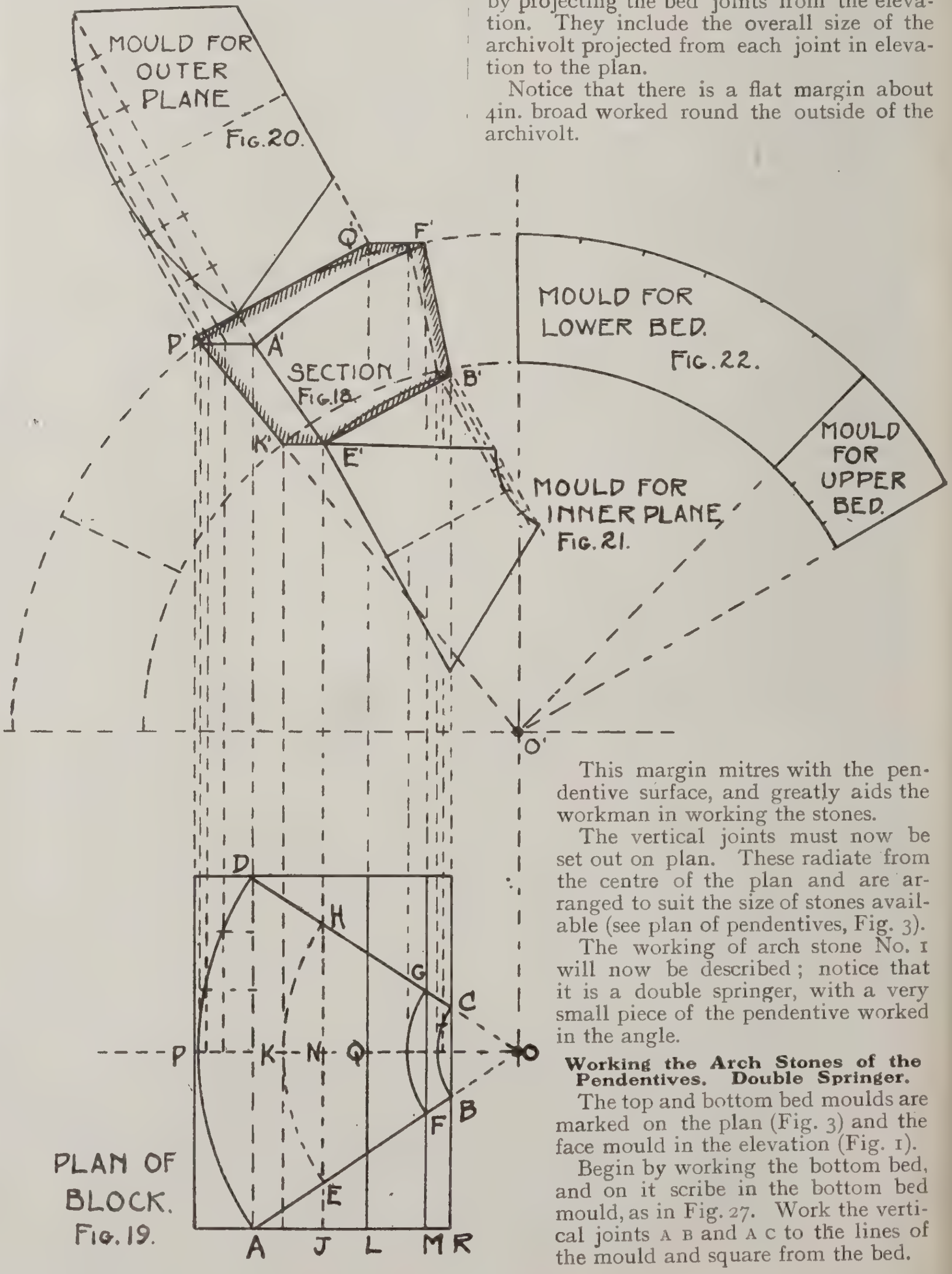
The profile of the pendentive (Fig. 1) is found by describing an arc of a circle with a radius equal to half the diagonal of the square plan (Fig. 2).

The bed joints are now projected through the profile, and we thus find the depth of each course in the pendentive. This shows the arrangement of the corbel, and how the courses vary in depth and form.

From the section of the pendentive a joint mould is made for each course except the bottom one.

Bed moulds are got from the plan (Fig. 3) by projecting the bed joints from the elevation. They include the overall size of the archivolt projected from each joint in elevation to the plan.

Notice that there is a flat margin about 4in. broad worked round the outside of the archivolt.



This margin mitres with the pendentive surface, and greatly aids the workman in working the stones.

The vertical joints must now be set out on plan. These radiate from the centre of the plan and are arranged to suit the size of stones available (see plan of pendentives, Fig. 3).

The working of arch stone No. 1 will now be described; notice that it is a double springer, with a very small piece of the pendentive worked in the angle.

Working the Arch Stones of the Pendentives. Double Springer.

The top and bottom bed moulds are marked on the plan (Fig. 3) and the face mould in the elevation (Fig. 1).

Begin by working the bottom bed, and on it scribe in the bottom bed mould, as in Fig. 27. Work the vertical joints A B and A C to the lines of the mould and square from the bed.

On these joints scribe in the face mould (Fig. 27).

Now work the top bed parallel to the bottom bed and to the exact height of the face mould (Fig. 28).

Scribe in the top bed mould and work the check D through from bed to bed, keeping the plane containing the archivolt moulding clean, as in Fig. 29.

Apply the archivolt face mould (which is taken from the face mould already used), guided by lines squared down from the top bed, and scribe in the soffit line, the splay joint, and breadth of archivolt (Fig. 29).

Next work the splay joints as shown in Fig. 30, and scribe in the section mould of the archivolt and soffit panel.

The soffit, panel mouldings and archivolt are worked through, guided by templets where necessary (see Fig. 31). Then, lastly, the small part of the pendentive (marked P in the figure) is worked. The templet required for this is taken from the section of the pendentive at the springer course (Fig. 1).

Arch Stone No. 3 in Third Course of Pendentive.

The bed mould is shown in the plan (Fig. 3) and the face mould in elevation (Fig. 1).

First work the top bed (a part only of which will remain) and on it scribe in the bed mould (Fig. 32).

Next work the vertical joint A B, and the pendentive joint square from the top bed. Scribe the face mould on the joint A B, and the section mould of the pendentive for this course on the other joint, as in Fig. 32.

Rough out the surface of the pendentive, working from the joint towards the mitre, and point off the vertical part between the joint A'B and the pendentive joint (Fig. 33).

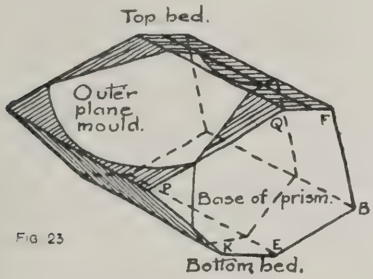


FIG 23

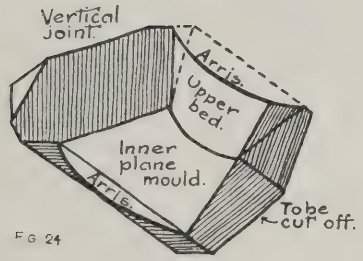


FIG 24

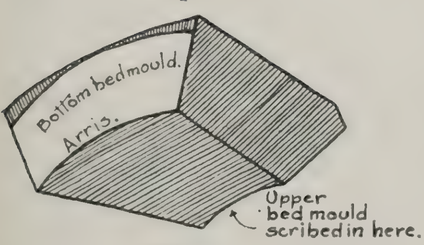


FIG 25

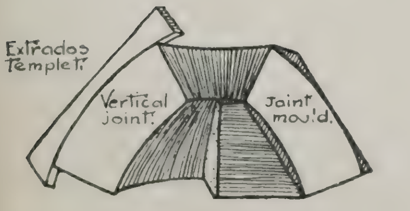


FIG 26

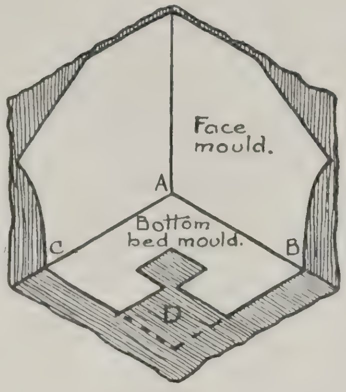


FIG 27

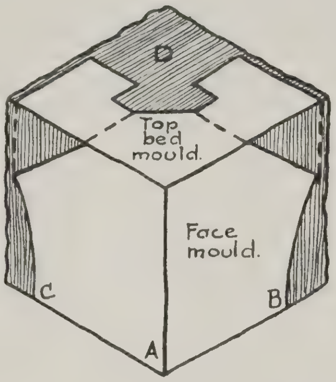


FIG. 28

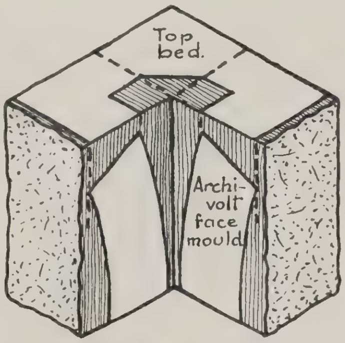


FIG. 29

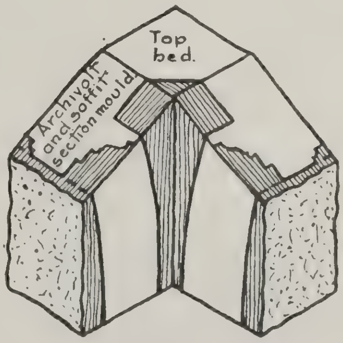


FIG. 30

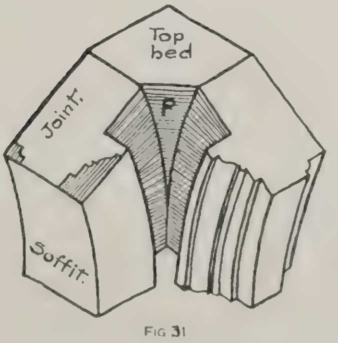


FIG 31

Also work a plane surface to contain the archivolt moulding, and scribe in the archivolt face mould, the application of which is guided by lines squared down from the bed. The splay joints are now worked through from the face to the side A B.

Scribe in the section mould of soffit panel and archivolt on both joints (Fig. 34), and work the mouldings through.

The small part of the pendentive and the outer margin of the archivolt are now cleaned into the mitre, as in Fig. 34.

Setting the Courses in the Dome.

In building up the courses in the dome, the mason requires some means of checking the work as it proceeds.

In the arch the stones are tested by a trammel working from the centre, but this cannot be applied to the inside of the dome surface owing to the position of the centering.

A very accurate method is to cut a wooden mould to the outer section curve for each course with the top edge level, as shown in Fig. 35.

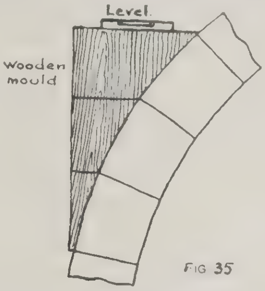


FIG 35

The mould is held exactly to the top and bottom arrises of the stone, and a spirit-level is applied on the top edge. The mould must be held plumb, and radiating to the centre of the dome.

It may be made to take in a number of

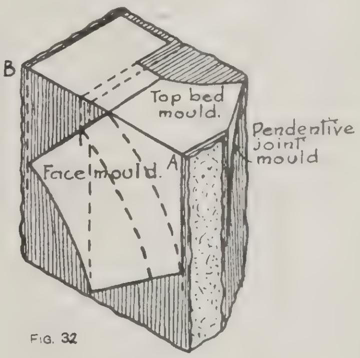


FIG. 32

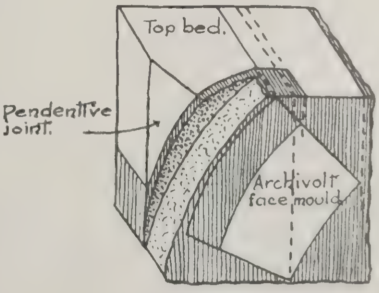


FIG 33

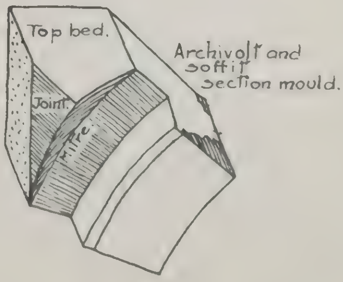


FIG 34

courses if desired, in which case the lines of each course would be marked on it to check them properly.

Another method is to work with a trammel revolving on a centre point at the top of the dome, but this is not so accurate as the method already described.

In conclusion, great importance should be attached to the study of the science of masonry, both by the architectural student and craftsman.

Builders have at times had their wits highly exercised by difficult masonry problems, of which the one we have now considered cannot be classed as the most difficult.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

School Requirements.

West Dulwich.—W. writes: "I believe the Board of Education issue a schedule of requirements in regard to new schools. Where can I obtain this, and what is the cost of it?"

Messrs. Eyre & Spottiswoode, the King's Printers, of East Harding Street, Fetter Lane, E.C., issue these, price 3d.

Power of Rural Council to lay Drains.

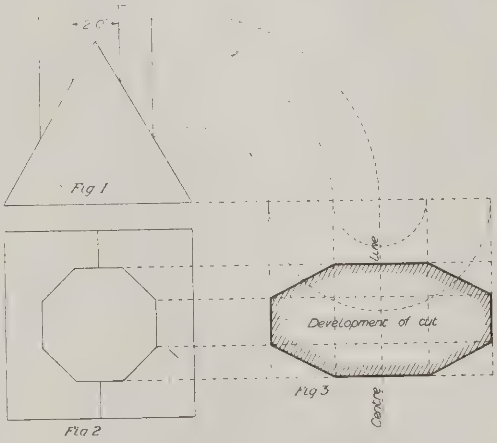
Sheringham.—Heather writes: "Have a rural district council power to lay a drain across private property? If so, what Act empowers them, and are they bound to compensate?"

Yes, under section 16 of the Public Health Act, 1875 (38 & 39 Vict., c. 55) the authority may "after giving reasonable notice in writing to the owner or occupier—if on the report of the surveyor it appears necessary—(carry any sewer) *into through or under any lands whatsoever within their district.*" Failure to give such notice is good ground for granting an injunction to restrain a local authority from constructing a sewer through private lands (*New River Co.* v. *Ware Union R.S.A.*, 1883, &c.). But if the owner has consented he cannot afterwards obtain the injunction even though the notice has not been served (*Long* v. *Fulham Vestry*, 1898). "Into, through or under" means that you must take it in and take it out either by "through or under"; the authority cannot take the sewer "into" private land and leave it (*Cator* v. *Lewisham B. of W.*, 1864). A notice is reasonable when it specifies the object of an entry on private premises to be the construction of a sewer of certain dimensions, and shows that the entry will go from that point in an oblique direction; it is not necessary that a map should accompany it (*Cleckheaton Industrial Self-help Society* v. *Jackson*, 1866). The notice must be given to the owner or occupier. The word "through" gives the authority power to construct the sewer above the ground level and support it by a permanent embankment. So far as decisions go, no right of an authority for *lateral* support for a sewer has been made out; but the Act is held to imply *subjacent* support for the sewer, and a corresponding obligation on the landowner so to deal with his land as not to take away support from a sewer which the authority have placed there, or which is vested in them (*Corporation of Dudley*, 1881, 8 Q.B.D. 86). By application to a court of summary jurisdiction the authority may, under section 305 of the Act of 1875, obtain an order authorizing them to enter on lands where entry has been refused by the owner or occupier (*Lamacraft* v. *St. Thomas R.S.A.*, 1880). The word "sewer" as used in the Act is sufficient to include manholes. The words in section 16, "if on the report of the surveyor it appears necessary," relate not to the notice but to the necessity of carrying the drain through the lands. (*New River Co.* v. *Ware Union R.S.A.*, 1883). The surveyor is the person to determine the necessity; if he exercised his judgment and came to a conclusion in good faith the court ought not to interfere, even though other courses might be shown to be practicable by which entry on private lands might be avoided (*Lewis* v. *Weston-super-Mare, L.B.* 1888). The surveyor must be a fit and proper person appointed to the position under section 189 of the 1875 Act. Under section 308 of the Act the owner of private land so entered upon can claim full compensation, to be settled by arbitration in manner provided by the Act, or, if the compensation claimed does not exceed the sum of twenty pounds, by application to a court of summary jurisdiction. The owner of the land cannot compel the authority to exercise their right of purchasing the lands.

Roof Surface cut by Octagonal Chimney.

Bolton.—Assistant writes: "An octagonal chimney shaft, of which each face is 2ft., cuts centrally through the ridge of a roof of 60 degs. Draw the plan and determine the exact shape of the opening. I cannot find a solution in my geometry books."

Books on practical geometry cannot show all the applications that arise in practice, and it is therefore incumbent on students to consider well the principles of what they read so that they may make their own applications as occasions arise. Fig. 1 shows an end elevation and Fig. 2 a plan of the proposed chimney shaft. The roof is cut to the smallest dimensions, and may be made to any span by simply continuing the lines. Fig. 3 shows the part cut out by the chimney from the two roof planes, both being shown opened out flat. The principle of the construction is to produce lines from the various points in two directions so that their inertsection will give the true plan.



HENRY ADAMS.

Books for Examinations.

Pembroke.—Interested writes: "Which are the best books (not too expensive) to study for the examinations of the Society of Architects and the Royal Sanitary Institute?"

The following are the best books to study for the Society of Architects' examination, although other books should be read to obtain a wider knowledge of the various subjects:—"History of Architecture," Fletcher; "The Orders of Architecture," R. Phené Spiers; "Greek and Roman Architecture," Anderson and Spiers; "Italian Renaissance," Anderson; "Gothic," Rickman; "Gothic," Prior; "How to Estimate," Rea; "Quantities," Davis; "Specifications," Leaning; "Building Construction," Longman; "House Drainage," Middleton; R.I.B.A. Conditions of Contract; "Specification No. 8." For the Royal Sanitary Institute examination the following books should be obtained:—"Lessons in Elementary Physics," Balfour Stewart; "Experimental Chemistry," Parts I. and II., Reynolds; "Modern House Construction," Sutcliffe; "Hygiene," Fletcher; "Hygiene" Parkes; "House Drainage," Middleton; "Building Construction," Longman; "Sanitary Engineering," Moore.

Buildings to measure near Rayleigh.

London.—H. S. writes: "Is there anything suitable to measure at or near Rayleigh, Essex, for the R.I.B.A. intermediate examination?"

Stanford-le-Hope, Fobbing, Hadleigh, Prittlewell, Horndon, Woodham Ferris and Mucking should supply plenty of good examples to measure. Churches at Morgeretting, Mountnessing, Ingatestone and Hutton, all close together, within easy train distance of Rayleigh, will furnish ample field for sketching. Chelmsford and the surrounding district contain many fourteenth and fifteenth-century churches. L. G. R.

Book of House Designs.

London.—F. H. F. writes: "Have you published any book showing designs, &c., of a house costing about £1,500 to £3,000, say, within a radius of thirty miles from London?"

No, we have not, but we can supply readers with any of the books on house design mentioned in our book lists.

Charges for Architect's Services.

Loughborough.—Ignorant writes: "During my residence in a suburb of London my landlady's son asked for my 'professional opinion' upon some houses which he thought of purchasing. I visited several, and gave an opinion upon their respective values, &c., and he afterwards bought one. Later he again sought my help in reference to the building of a shed in the garden. I made a rough sketch plan in pencil, took out quantities, ordered materials and supervised the work, which was carried out by himself and his brother. I gave him the invoices for materials (which were made out to me), and called for payment, which was not forthcoming. When leaving the district (in October last) I deducted the larger portion of the amount from what I owed to my landlady—his mother. He has not paid the balance, and evidently does not intend to do so. Am I not entitled to charge fees for my services and to claim them through the county court in addition to the balance upon cost of materials? I have not at present sent in any account, and should not have charged him if he had behaved decently. He was, I think, just under age at the time of these transactions (last March—July)."

As the client was a minor, you appear to have little chance of redress, and we advise you not to go to law.

Stippling for Greenhouse.

Surrey.—C. writes: "What are the best constituents and proportions for a white stippling solution for the roofs of greenhouses, to stand all the summer and be removable in the autumn?"

We suggest the use of one of the washable distempers or water paints.

Preservation of Stonework.

Southsea.—W. A. C. writes: "What is the best way to treat a Portland head-stone in order to preserve it?"

The baryta treatment is the best to adopt. Particulars are given on p. 246 of our issue for May 3rd.

THE "UNDERGROUND" POWER STATION AT CHELSEA.

IN our issue for February 15th last we gave some illustrations showing the erection of the large new power station at Lot's Road, Chelsea, for the London "underground" railway, together with particulars of the steelwork by Messrs. Mayoh & Haley. We now give a series of other photographs showing different parts of the station, in course of erection and as completed, supplemented by particulars of the work carried out by the several sub-contractors.

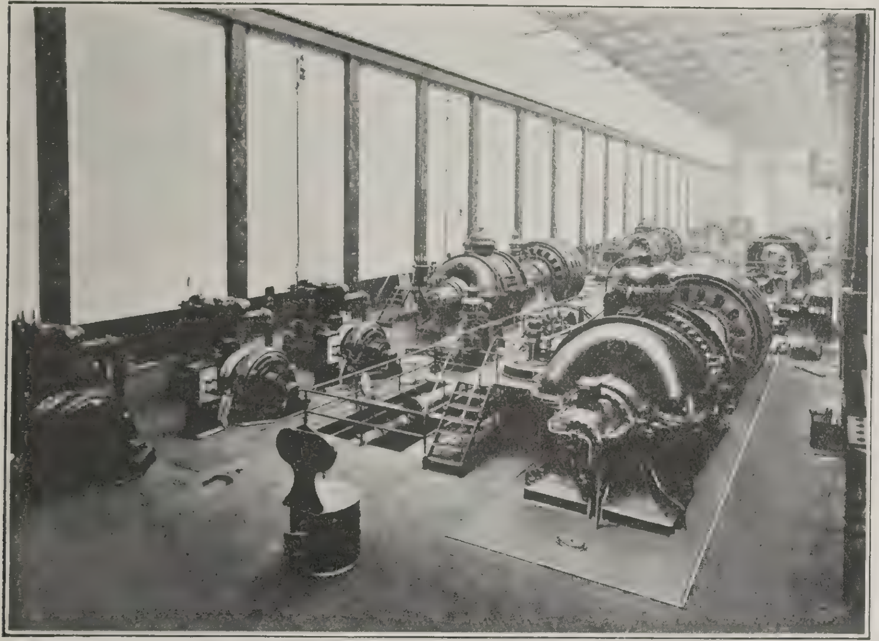
ELECTRICITY GENERATING STATION, LOT'S ROAD, CHELSEA.

Electrical Equipment.

Particulars of the electrical capacity of the station, which has been equipped by the British Westinghouse Electric and Manufacturing Co., Ltd., were given in our first article, and in connection with this part of the work we need only refer to the substation at Hounslow, illustrated on p. 280 of this issue, where the current of 11,000 volts is reduced by static transformers to about 440 volts, converted into a continuous current of 600 volts, and supplied at that pressure to the rails.

Plumbing; Paving.

The plumbing work at the station was executed by Messrs. Doulton & Co., Ltd., of Lambeth, while the paving of landings, lavatories and offices with marble mosaic was carried out by the Atlas Stone Co., Ltd., of Cambridge.



INTERIOR VIEW, SHOWING TURBO-GENERATORS.

Glazing.

The glazing of the skylights was placed in the hands of Messrs. Mellowes & Co., Ltd., of Sheffield and London. It is of the greatest importance that buildings of this kind, where there is expensive machinery running at high speed, should be protected in such a way that no water either from rain, snow or condensation, nor dust and blacks, may have the slightest chance of falling down upon the machinery, as it would do irreparable damage in a very short time. Messrs. Mellowes & Co. have used their well-known "Eclipse" system of glazing for this purpose. Their steel sash bars, enclosed in a soft inoxidizable metal, carry the longest squares of glass without any possibility of breakage, either from the vibration of the machinery or from expansion or contraction of the roof itself. It is a great success, and is much appreciated by the engineers. The particular advantages of this glazing are that it requires no painting either outside or inside, and it gives the largest amount of light with the greatest amount of strength; while, as the steel bars are entirely enclosed in soft metal coverings, the glazing is practically indestructible. As showing the confidence which Messrs. Mellowes have in the permanence of their work, we may state that they have undertaken to maintain the glazing free of all cost to the railway company for a period of ten years after completion.

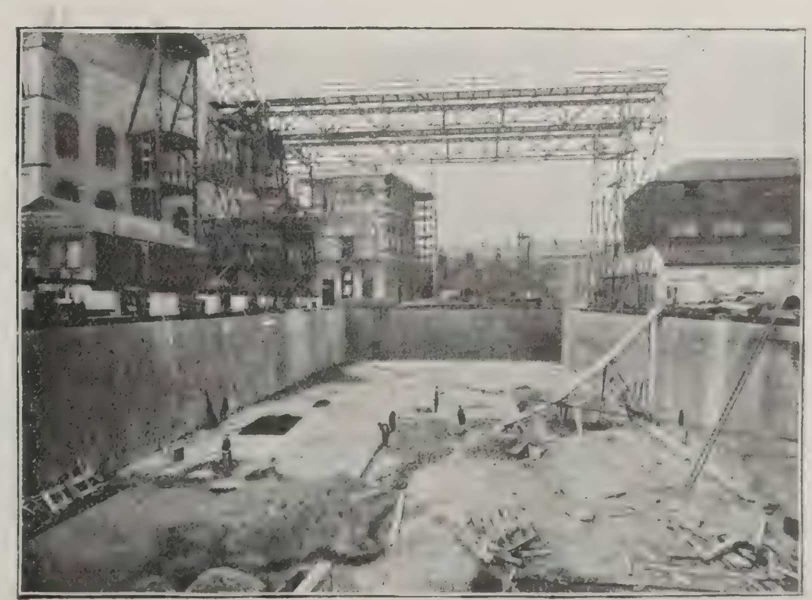
The whole of the window mullions and sills of the engine- and boiler-house roofs were covered with galvanized iron by Messrs. H. Pontifex & Sons, Ltd., of London, E.C., to protect the steel framework from the weather.

Joinery.

The joinery work at the station was executed by Messrs. Ford & Walton, Ltd., of Kilburn, the whole of the material for the main building being executed in Californian red pine, rendered non-flammable. The locks and fastenings were specially made in America. Non-flammable joinery was also furnished by the Fire-Resisting Corporation, Ltd., of Fulham.

Expanded Metal Flooring.

The flooring at the station, as well as at the sub-stations and the car-sheds, railway stations, &c., is on the expanded metal system. We give several illustrations showing the work in course of erection. Expanded metal has also been used for reinforced-concrete work in the foundations, retaining walls, roofing, bridge decking, &c.



DOCK, WITH EXPANDED STEEL AND CONCRETE BOTTOM IN COURSE OF CONSTRUCTION.

TERRA-COTTA CAP TO CHIMNEY.

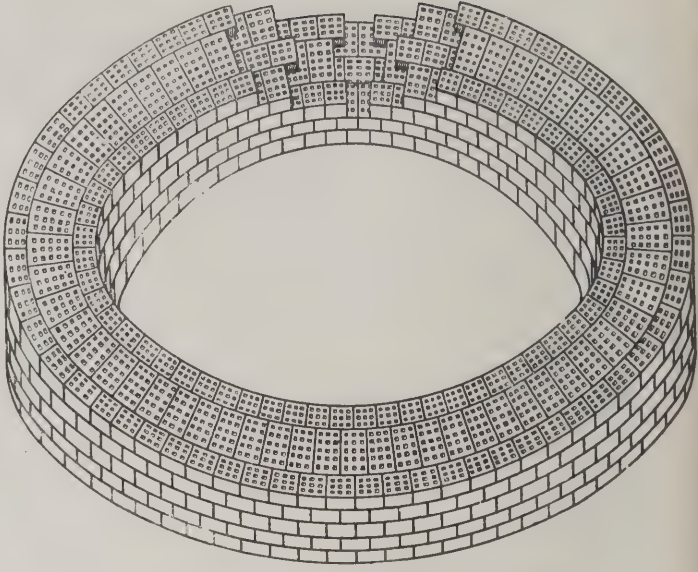


DIAGRAM SHOWING CONSTRUCTION OF CHIMNEY.

The Chimneys.

Very noticeable features of the station are the four huge brick chimneys. These have been erected by the Alphons Custodis Chimney Construction Co., of 119, Victoria Street, S.W., on a patented system originated by the company in Germany thirty years ago. As the illustrations on this page show, the bricks or blocks used are set out to a radius and are each perforated with six holes to allow of more thorough burning in manufacture, thus increasing their density and strength, while reducing their weight. These perforations also form dead air-spaces in the wall of the chimney and prevent the rapid heating and cooling of the wall. The blocks are laid in cement-mortar, which is worked into the perforations for about ½in. so as to lock the whole together. Each of the four chimneys is 275ft. high and 19ft. in diameter, and has a terra-cotta cap. In our issue for February 15th we gave sections and elevations of these chimneys, with a view looking up one in course of erection.

Other Contracts.

Of the other firms who carried out work at the station we may mention the Columbian Fireproofing Co., Ltd., of 37, King William Street, E.C., by whom the concrete roofs and coal bunkers were erected; Messrs. The Crittall Manufacturing Co., Ltd., of 98, Leadenhall Street, London, E.C., who supplied the steel sashes and staircases; and Mr. J. Percy Day, of 3, Victoria Street, S.W., by whom a quantity of "Eubœolith" flooring was laid on portions of the basement, ground- and first-floor levels of the office block.

An Electric Crane.

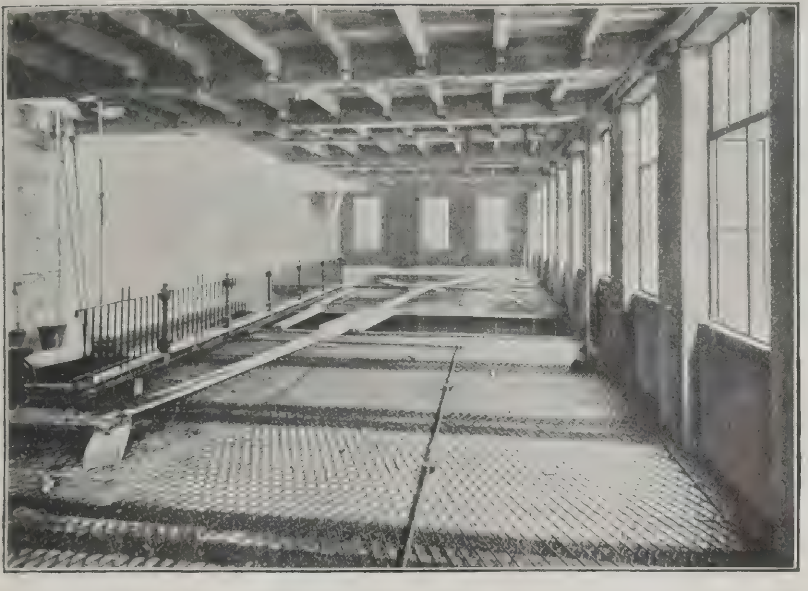
The 40-ton portable electric crane illustrated on this page was specially built by Messrs. Jessop & Appleby Brothers, Ltd., of Leicester and London, for use at the station, arrangements being made to enable the crane to safely handle its full load without attachments to the track on which it travels. The undercarriage frame is of mild steel, and is mounted on eight wheels with central flange and double treads, and each pair is carried in steel equalizing frames so that every wheel bears its share of the load. The wheels are of cast steel, bushed with gunmetal. The gauge is 12ft. 6ins., and all appliances for travelling by electric power are controlled from the driver's platform. The jib, constructed of mild steel, is curved to afford the utmost possible clearance, this being required for handling armature rings, and other large and heavy pieces of machinery and plant, in very limited space. The radius of the jib is 24ft., and the height from rail-level to the underside of lifting hook is 35ft. Messrs. Jessop & Appleby Brothers also supplied 8-ton and 12-ton hand-power overhead travelling cranes to the sub-stations of the "underground" railway.

Mill Hill Park Car Sheds.

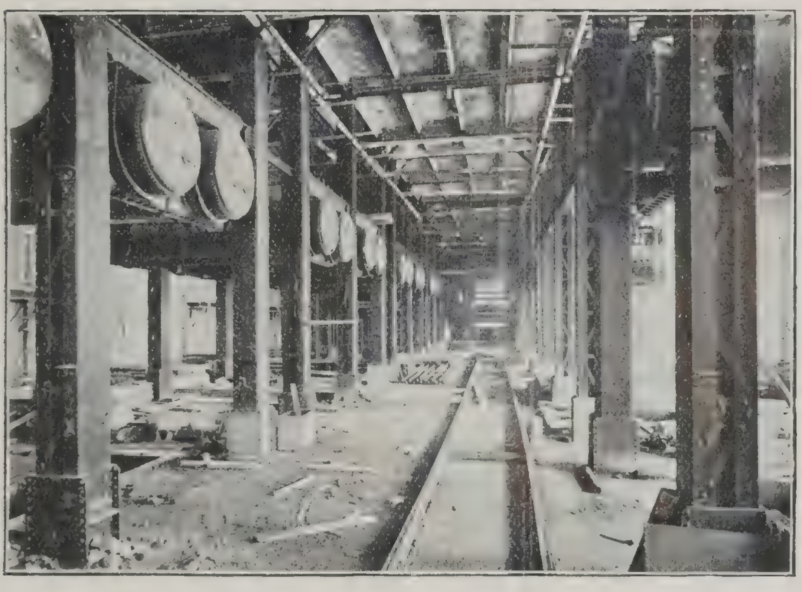
While dealing with the main station at Chelsea it is opportune to refer to the large car-sheds for repairs which have been built by the company at Mill Hill Park. The building is 803ft. long and 216ft. 6ins. wide, divided in three bays, two being 41ft. 3ins. high from footings to apex of gable and the other bay 55ft. high. The brickwork, which was carried out by Messrs. Ford & Walton, Ltd., was started on April 22nd, 1904, and completed by November 7th, 1904, which, after allowances for wet weather, was under the contract time of six months. 1,750,000 bricks were used (excluding special-made blue brick copings, sills and dressings), with about 400 tons of Portland cement and lias-lime. There are six lengths of breeze-concrete and asphalt gutters, each 802ft. long, and 102 lengths of special heavy rainwater-pipes with copper heads and guards. The steel roof was manufactured and erected by Messrs. Mayoh & Haley, and the skylights by Messrs. Mellowes: the lantern has a particularly light appearance, as the squares of glass used are more than 10ft. long in one piece. We give exterior and interior views of these car-sheds on p. 280. For the interior view we are indebted to "The Tramway and Railway World."

The Auld Brig of Ayr is to be taken down and rebuilt, stone for stone, on new foundations, adhering as far as possible to the present form and structure. Mr. Young, burgh surveyor, will act as engineer for the work, Mr. Eagleham as consulting engineer, and Mr. J. A. Morris as consulting architect.

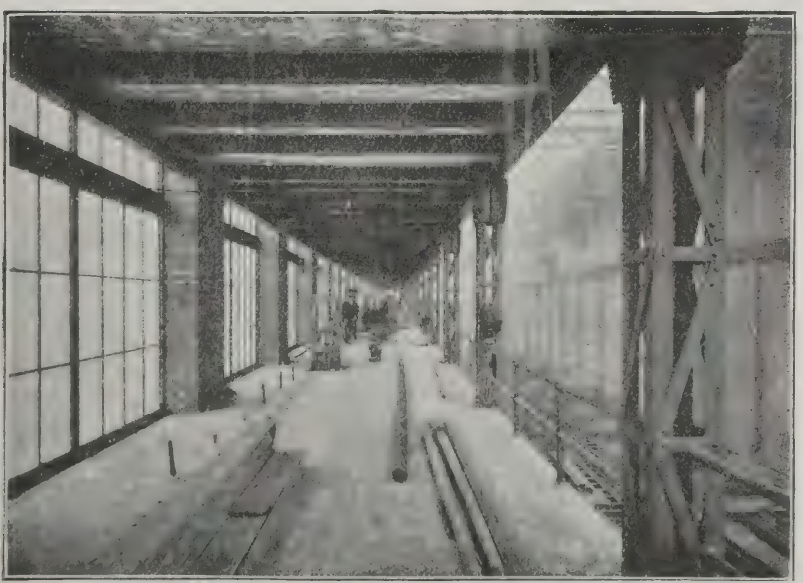
40-TON PORTABLE ELECTRIC CRANE FOR USE AT POWER STATION.



EXPANDED STEEL AND CONCRETE FLOORING IN COURSE OF CONSTRUCTION.



EXPANDED STEEL AND CONCRETE FLOORING FINISHED ON FACE AND SOFFIT.



GALLERY FLOORING OF EXPANDED METAL AND CONCRETE,

ELECTRICITY GENERATING STATION, LOT'S ROAD, CHELSEA.

Correspondence.

R.I.B.A. Council Elections.

To the Editor of The Builders' Journal.

Sir,—In the circular issued by Mr. George Aitchison, R.A., Mr. J. Macvicar Anderson, Sir William Emerson and Sir Aston Webb, R.A.—all past-presidents of the Institute—these words occur: "It appears to us of the greatest importance that the members of its council should be representative architects of the highest standing, whose names are well known to the profession and the public, for without the experience and assistance of such men we are convinced the work of the Institute cannot prosper, or confidence in it be maintained"; and they "urge the importance of selecting only the most representative men as members of its council, in whom all can have confidence while this important question (compulsory registration of architects) is being considered. If this is not done, we are convinced a very serious crisis will arise in the affairs of the Institute which will paralyze, if it does not wreck, its usefulness, and thus defeat the object we all have in view, *i.e.*, the advancement and the highest interests of the art of architecture."

These are weighty words, and it behoves all members to consider them well if they seek to advance the highest aims of the Institute; to record their votes in accordance with the advice given, and to refuse their support to those candidates whose avowed aim is to force through the compulsory registration of architects under Parliamentary powers.

I have voted in every election since I was elected a Fellow and have sometimes been surprised at seeing the names of those nominated and elected, but never have I been more surprised than in the *personnel* of the present council. When the list came out, it appeared to me—and to many I venture to think—as a veritable *débâcle*, when men by no means "representative architects of the highest standing" occupied the seats of many who were.

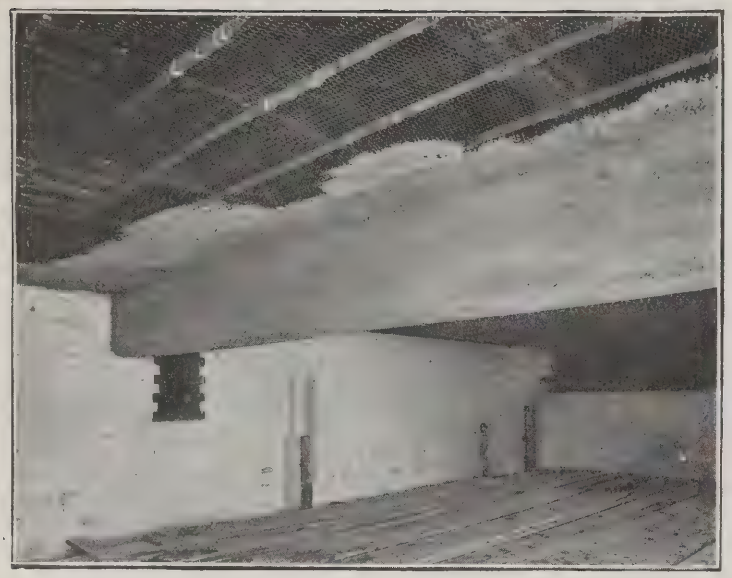
To those entitled to vote and who have not yet done so, not knowing among the extensive list of candidates this year against whom to place an X, I would suggest that the circular issued by Mr. W. Gillbee Scott offers some valuable hints.—Yours truly,

COLE A. ADAMS.

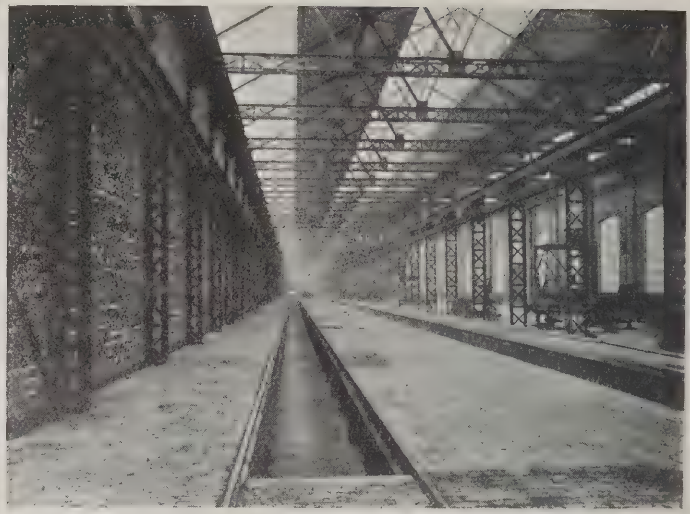
To the Editor of The Builders' Journal.

Sir,—That small minority forming the anti-registrationist body of the Royal Institute, still suffering from the shock caused by the slaughter amongst their ranks at the last elections, realize that their only hope is to adopt the electioneering measures which they so mercilessly condemned in their opponents, and to appeal to the electorate for its vote and support. This minority have issued a circular intimating that the "leading architects" (under which vainglorious heading it must be inferred the signatories class themselves) are the only persons through whom the Institute can ever hope to maintain its dignity or conduct business of "the nicest and most delicate nature." This is their platform. It looks new, but it is only the old worm-eaten platform the remnants of which have been fished out, patched up and ill-disguised by a clean coat of paint. In short, they invite the electorate to return to the old "do-nothing" policy and all will be forgiven.

Not a hint is given in their circular that any one of those subscribing is in any way predisposed to registration even as a principle. It is considered sufficient that they dub themselves "leading architects" and that they promise to be very nice and delicate, and above all, dignified—dignity of course being a quality incompatible with the holding of



SUSPENDED FIRE-RESISTING CEILING AND STEELWORK ENCASING IN BATTERY ROOMS, CHELSEA.



ONE BAY OF MILL HILL PARK CAR-SHEDS.

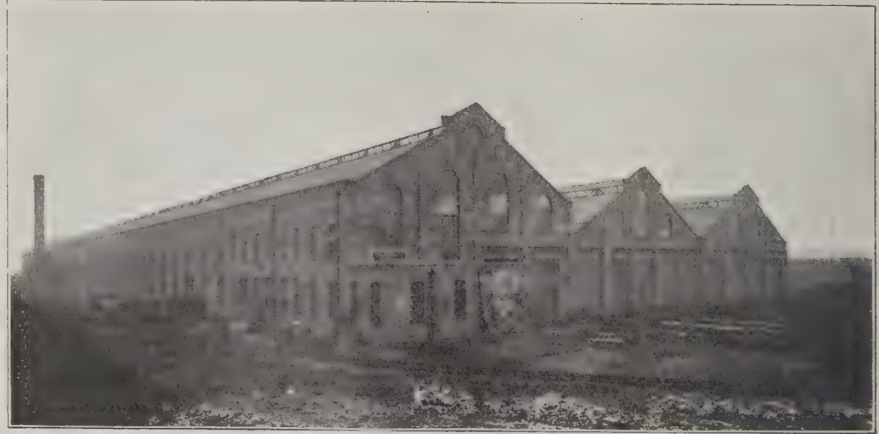
registrationist views. Think how important it is that the Turveydrop manner should be well in evidence at the forthcoming international congress of architects, which is casually referred to in the circular. Here is exhibited a thinly-veiled dread that the registrationist party will, at the time of this great congress, be still in power, and will grasp the not-to-be-missed opportunity of bringing the registration question prominently forward, of passing a monster vote in favour of the movement, of presenting a memorial for signature by practising architects. The opponents of registration have realized, perhaps more keenly than its supporters, the bearing which this great congress may have upon the realization of events.

The last council elections transformed that body from a côterie which persistently ignored the wishes of the majority into a body representative of those desires, a body which in one year of office has practically completed the draft of a registration Bill, a body which should be again returned in order that it may continue the good work.

It therefore behoves every good registrationist to cast his votes only for those who are declared partisans of the movement and have proved their sincerity by positive and energetic action on the late council.—Yours truly,
ANTI-STAGNATION.

OUR PLATE.

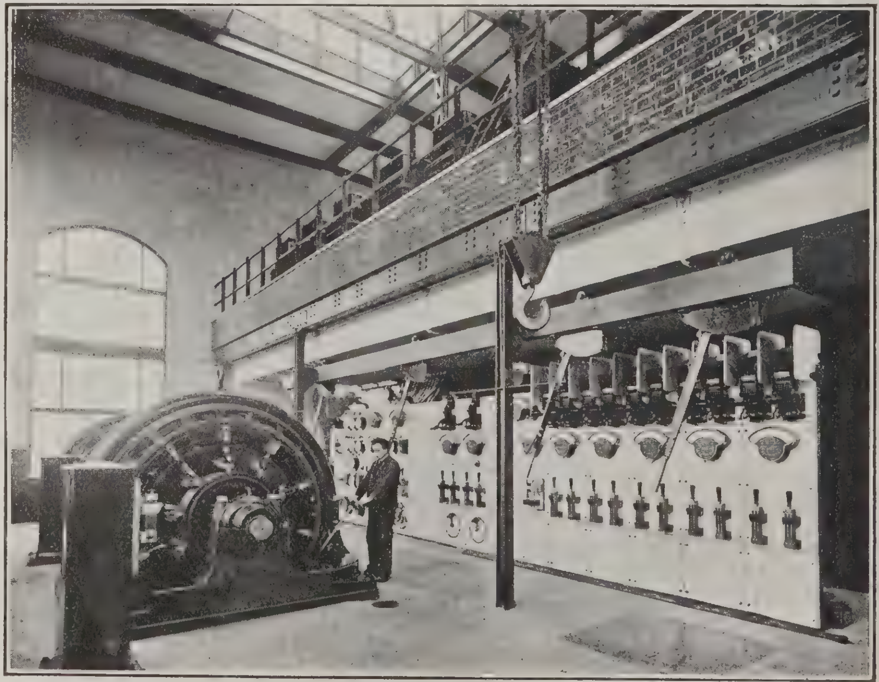
THE church of St. Stephen, Springfield, Wolverhampton, is to be built in red brick. It is planned on the three sides of an irregular triangle, the large court between the body of the church and the proposed priests' house being planned as a garden for the clergy. The vestries lie between the tower and the body of the church, and on their inner side is an open cloister. Below the tower is a baptistery, which is connected with the church by an open cloister, and which centres with the west entrance. Architecturally, therefore, there is a vista from the font of the baptistery to the altar at the extreme east. This altar is raised very high, and beneath it is a mortuary chapel, approached from the extreme north-east. In the tower is a bell-chamber, which is approached from the west end of the church by a ringers' gallery seen over the great circular arch which connects the church with the tower. From the centre of this arch is designed to hang a great arc light. Springfield Church is planned to stand in a very poor suburb of Wolverhampton, where there is a rapidly-growing population of artizans and labourers. It is designed with the intention of serving a great communal want in the neighbourhood, and is the only building of architectural importance there. The drawing reproduced as a centre plate shows the body of the church, the vestries and the tower, while that on p. 281 shows as well the suggested clergy-house and parsonage.



MILL HILL PARK CAR-SHEDS.

Obituary.

Mr. John Tweedale, for twenty-six years a partner in the firm of Messrs. Smith & Tweedale, architects, of Leeds, died last week, aged 51.



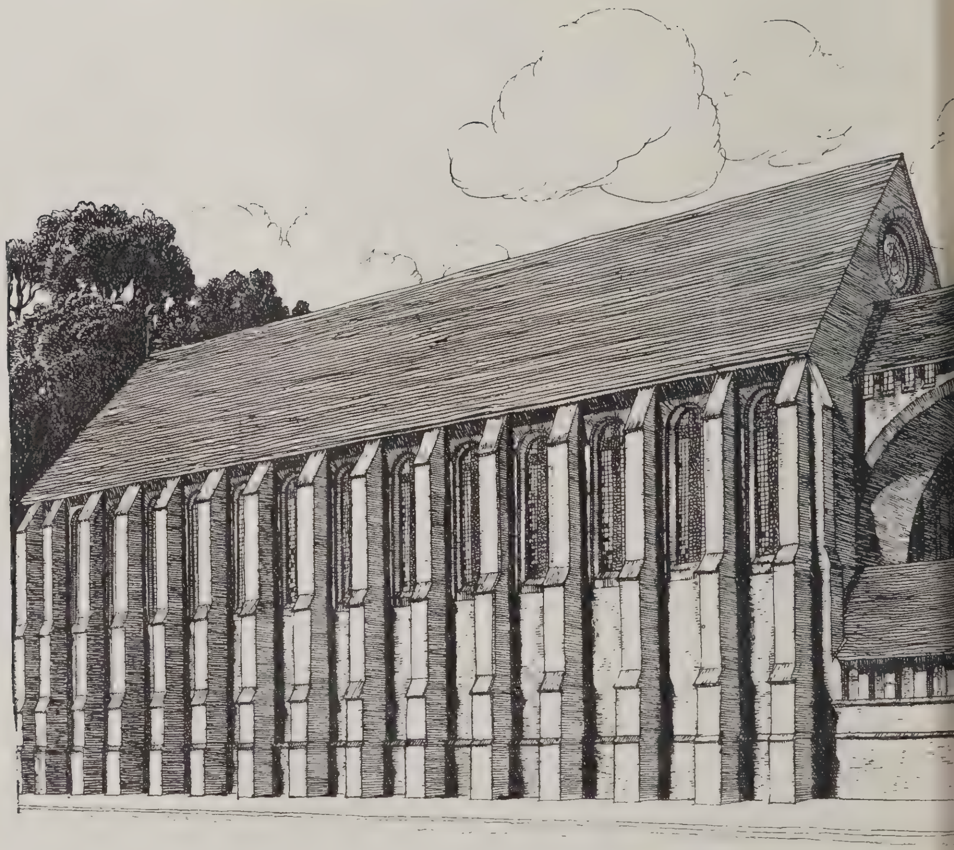
HOUNSLOW SUB-STATION.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

Supplement to
The Builders' Journal and Architectural Record,
Wednesday, May 17th, 1905.

CHVRCH at SPRINGFIELD, WOLVERHAMP

C. R. ASHBEE M.A., Archt.,
"Magpie & Stump", Chelsea.



(Royal Academ

ON

1905.)

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

Keystones.

The new City Engineer, Mr. Frank Sumner, will enter upon his duties on Midsummer Day. Meanwhile Mr. D. J. Ross continues in office.

The new Carnegie Library at Leicester was opened last week. It has cost £12,000 and occupies a central site near the town hall. Mr. Edward Burgess was the architect.

A new Baptist Church is being erected in Shooter's Hill Road, Blackheath, from designs by Messrs. Dottridge & Walford. The builders are Messrs. Patman & Fotheringham, Ltd.

Messrs. Groome & Bettington, architects and surveyors, of Palace Chambers, King Street, Hereford, have been instructed to carry out their scheme for the extension of the Wesleyan Church, Bridge Street, Hereford.

Mr. G. Bertram Bulmer, F.R.I.B.A., has been elected president of the Leeds and Yorkshire Architectural Society for the current year, and Messrs. H. S. Chorley, M.A., A.R.I.B.A., and W. G. Smithson, A.R.I.B.A., have been elected vice-presidents.

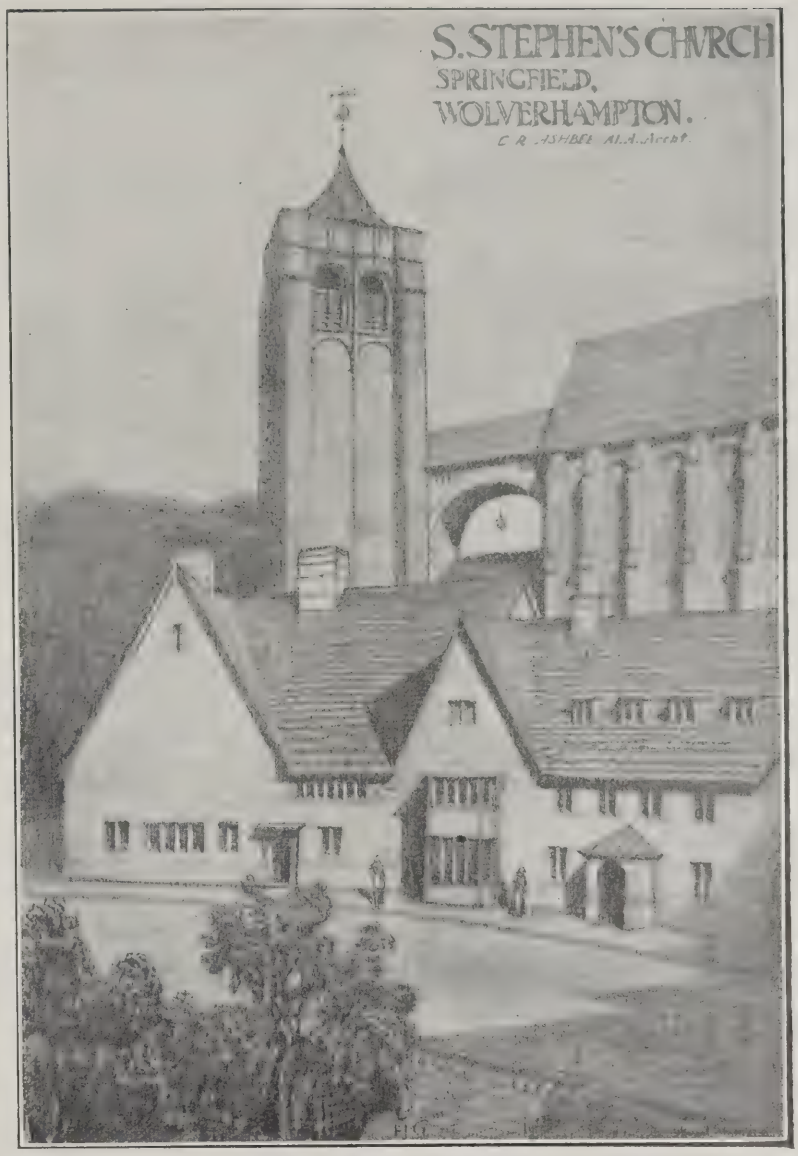
Society of Architects' Proposed Visit to Chester and Liverpool.—With the object of enabling some of the provincial members to meet together, the Society of Architects propose to organize visits to Chester and Liverpool on Friday, June 2nd, and the following day.

The Edinburgh Architectural Association recently visited Niddrie Marischal. Much interest was evinced in the old tower, begun about 1600 and converted later into a spacious staircase to serve the south wing, which was built by Sir John Wauchope, who succeeded to the estate about 1632. Sir John afterwards decorated the dining-room ceiling, still existing, with devices in honour of Charles II.

A Huge Furniture Sale.—About £35,000 worth of art furniture—the stock of Messrs. Norman & Stacey, Ltd.—is now offered for sale by Messrs. Oetzmann & Co. at 62-79, Hampstead Road, W., at greatly reduced prices, varying from 30 to 50 per cent. off the original prices. Purchasers, too, can pay on the deferred instalment system if they wish. Messrs. Oetzmann will send an illustrated catalogue post free on application.

The New Gaiety Restaurant and Hotel in the Strand was opened last week. The architects were Messrs. Ernest Runtz & Ford, assisted by Mr. Norman Shaw, R.A. The façades are in Portland stone. Among the features of the interior are the restaurant (over which is the ball-room), the Adam banqueting hall, the masonic temple, and the Dutch buffet. On the Strand front are three private dining-rooms named respectively after Nelly Farren, Kate Vaughan and Fred Leslie. The furnishing and decorations have been carried out by Messrs. James Shoolbred & Co., Ltd. The contractor was Mr. J. Carmichael, of Wandsworth.

Another Length of London's Roman Wall.—In the course of some excavations in Jewry Street, Aldgate, for the foundations of a new block of offices which are to be erected to the designs of Mr. W. H. Waterman, a perfectly preserved specimen of the old London wall 40ft. long., 12ft. high and 8ft. 6ins. thick has been discovered by the contractors, Messrs. N. Fortescue & Sons. The foundation of the wall when originally exposed was found to consist of a course of 2ft. of flint and clay, and in the height of the wall there were several courses of red bonding tiles, each about 16ins. to 17ins. long, 11½ins. wide and 1½ins. thick, between which was the masonry, the facing being well-dressed Kentish rag and the backing of rubble and cement.



(Royal Academy Exhibition, 1905.)

Mr. Vye-Parminter, architect to the British Embassy, Paris, and the Legation, Brussels, was presented to His Majesty the King when the latter was in Paris recently.

Art Treasures in French Churches.—Some time ago the French Minister of the Fine Arts sent a circular to the Prefects of the eighty-three Departments of France asking them to supply an inventory of the art treasures in the various churches in their jurisdiction. The result shows that the treasures in the Louvre, Luxembourg, Cluny, Carnavalet and other public galleries and museums are small in comparison with the artistic wealth of the country. The cathedral of Rheims contains "The Nativity," probably the finest piece of tapestry in the world, and the tapestries of Beauvais are appraised at a million and a half francs, while nearly two million francs is the sum divided between "The Virgin" at Mans, by Germain Pilon, and "The Vierge Dorée" at Amiens Cathedral.

Municipal Architecture.—At last week's meeting of the Coventry City Council it was decided to make no alteration in the practice followed in preparing and carrying out plans and designs for new public buildings and alterations to existing buildings. The mayor said the General Purposes Committee had fully considered the memorial from local architects on the matter. Two amendments were proposed and defeated to the effect that professional architects be employed on important undertakings instead of the work being carried out in the engineer's department. It was pointed out that the council would have an opportunity of voicing its opinions when important works had to be carried out.

The new Pier at Falmouth, called the Prince of Wales's Pier, has now been completed after two years' work at a cost of £7,000. The total length of the pier is 310ft., the portion nearest the town being of solid granite work; from that point the pier extends 200ft., constructed on the Hennebique system of reinforced concrete. The width of the outer pier is 36ft. The end of the pier is rounded, and provision has been made for extension, if necessary. The deck is formed with concrete from end to end; there is no timber about the construction. The contractor for the work was Mr. E. H. Page, of Cardiff. The Town Quay also has been enlarged at a cost of £3,000 by Messrs. Rickard & Son, of Penryn. The works have been carried out under the direction of Mr. L. G. Mouchel (the representative in this country for Hennebique reinforced concrete construction) and Mr. W. H. Tresider, borough surveyor of Falmouth.

Reinstatement of a Scottish Mansion.—A few weeks ago it was reported that a fire had occurred at "The Glen," Sir Charles Tennant's fine Peebles-shire seat, built fifty years ago by David Bryce. The damage caused by the fire, which gutted all that portion of the house containing the public rooms, was about £30,000. In the old building there were joisted floors and wood "safe lintels": the latter were burnt out, and the whole weight of the walls came on the stone outside sills and lintels, which of course cracked. The reinstatement and rebuilding of the mansion is now being undertaken under the direction of Mr. R. S. Lorimer, A.R.S.A., who is putting in reinforced concrete lintels and Stuart's Granolithic floors, 4½ins. deep, reinforced with rods on the underside—the rods being 1in. above the soffit, which is plastered 1in. thick. On the upper surface of the floors are arranged the electric-light tubes and bell tubes, with the necessary junction-boxes, &c., which are flushed up with 3ins. of breeze, and oak-boarding secret-nailed over. The 3ins. of breeze greatly assists in deadening sound. Screwed boards are left in the floors above all junction-boxes, &c., so as to afford easy access to these.

Messrs. Davis & Newman have set up in practice as architects and surveyors at Blackwood, Mon.

The Home Arts and Industries Association will open its twenty-first annual exhibition of woodcarving, inlay, metal repoussé, &c., at the Royal Albert Hall, S.W., on Wednesday next, May 24th.

The Royal Sanitary Institute held its annual dinner on Friday evening at Prince's Restaurant. The Duke of Northumberland, who presided, said that the Institute had been in active operation for thirty years, and had 3,200 members and an annual income of £8,000. It was proposed to move the Institute to larger premises, and a site was being considered. Towards the expense of the change the Institute had £10,000, but £15,000 more was wanted, and an appeal was now being made for funds.

The building over of Dean's Yard, Westminster, so as to form a large temporary building for the historical bazaar to be opened on May 23rd by the Duke of Connaught, is being carried out by Messrs. Simmonds Brothers, Ltd., under the superintendence of Mr. Percy Armytage, M.V.O. More than 40,000ft. run of floor boards will be laid on top of 16,000ft. of joisting. This, together with the rest of the materials used in the work, will weigh 70 tons. To keep this boarding in position 80,000 screws and about 8 cwts. of nails will be needed.

Edinburgh Architects and the Parish Council.—At a meeting of the council of the Edinburgh Architectural Association held last week the terms and conditions upon which the parish council propose to elect an architect and superintendent of works were under review. On the ground that the remuneration offered was far below the recognized scale of professional charges, the council of the Edinburgh Architectural Society expressed disapproval of the same, and resolved to communicate with the parish council on the subject and to ask them to reconsider the conditions of appointment.

London Squares: L.C.C. Preservation Bill rejected.—On Friday a Select Committee of the House of Lords considered the London Squares and Enclosures Bill, promoted by the L.C.C. Only one petition was presented against the Bill, the opposition coming from the Westminster City Council, who alleged that certain powers of the borough councils would be interfered with. Lord Robert Cecil, K.C., explained that there were 400 garden squares in London, covering about 400 acres, all of which might be built over by the owners. The Bill provided that no structures should be placed on the squares except such as were necessary for the use and enjoyment of the garden. Originally all the 400 squares were scheduled to the Bill, but now only 139 were affected, the remainder having been withdrawn on the objection of the owners. Evidence having been heard, the Committee decided that it was not expedient that the Bill should proceed, and it was accordingly rejected.

Birmingham Architectural Association.—At the annual general meeting held last week the following elections took place:—President, Mr. Thomas Cooper, F.R.I.B.A.; vice-president, Mr. J. L. Ball; members of council, Messrs. H. T. Buckland, Arthur Harrison, William Henman, Alfred Hale, A. E. McKewan, E. L. Percival and E. F. Reynolds. The annual excursion was discussed, and it was decided to go to Mont St. Michel at Whitsuntide.

Academy Professors.—There are two vacancies in the ranks of the Royal Academy professors, caused by the retirement of Mr. Alfred Gilbert, R.A., and Mr. George Aitchison, R.A., who filled the chairs respectively of sculpture and architecture. The election of their successors will take place at no distant date, but it is probable that the number of candidates for the posts will be small. The duties are not heavy, for the professors have nothing to do with the teaching in the schools except when they take their turn as visitors. The sole business of the Academy professors of painting, sculpture and architecture is to deliver each winter a series of addresses (usually six), and for this they are paid at the rate of so much a lecture. Formerly the honorarium for each address was £10, but lately this has been largely increased.

R.I.B.A.

Sculpture and Architecture.

A MEETING of the Royal Institute of British Architects was held on Monday evening at 9, Conduit Street, W., the chair being occupied by the president, Mr. John Belcher, A.R.A.

It was announced that Mr. William Beddoe Rees had been expelled from the membership of the Institute for unprofessional conduct.

Papers on sculpture and architecture were read by Mr. T. Stirling Lee and Mr. W. Reynolds Stephens. Mr. Alfred Gilbert, R.A., and Professor Lanteri, who were to have spoken, were unable to be present.

Mr. Stirling Lee said that since he had spoken before the Royal Institute of British Architects in 1901 he felt that under their present and their late presidents sculpture in connection with architecture had made much progress. From the earliest times man had desired to express his thought in form—he had taken this as a language. The great ideals of the whole world had been written in that language. If it had not been for sculpture on our buildings, how much knowledge should we have lost. We wrote our history—the history of the thoughts of our time—in that which was the most open of our books, namely, the art of architecture. No sculptor who had anything to do in public buildings or anything serious could approach it from any other point of view. He had to hand down to the future those thoughts of his time. Every sculptor needed to be a very deep thinker, and must always have been. He must note down the environment in which he lived. But did we as a nation understand the figurative language when we put sculpture in our buildings? Did we grasp the fact that we were putting on a language which was going to be read and understood by the public? How many persons were there who could be said to stop and read it; and yet that was the use of sculpture in building. In the old days they had no books, and people went about reading the language of Nature, but we had lost that, and we had lost that use of sculpture on our buildings. We now came to the æsthetic side of sculpture. As long as architecture existed it would use ornament, and sculpture was the highest form of ornament, and no doubt there was with every architect the desire to use that highest form of decoration. In sculpture the scale and lines of the building had to be harmonized with, and proportion, too. Every problem that they had in architectural sculpture was to be found solved in the Parthenon, and he used this to illustrate his remarks. He emphasized how well the Greeks understood the composition of line, and light and shade in sculpture. In the design of sculpture we first had thought, then line, proportion, light and shade, impressionism and colour—these governed them in their work in relation to architecture. Their position that night was that they had to classify sculpture as plastic and glyptic. Too often sculpture was a stone rendering of a clay figure. In comparing the work of Michaelangelo and Phideas we saw the difference of the anatomical science of the modeller and the geometrical science of the carver. If a modeller was put on to execute sculpture on a building his work would be found to be full of holes, but if a stone carver he would love the planes. We had unfortunately few stone carvers. It was raised as an objection that the carver took too long, but it was not so, for after he got his ideas the mason could take off the rough as the Greeks did, leaving the stone for his work.

Mr. W. Reynolds Stephens agreed generally with the remarks of Mr. Lee. He pointed out how often a sculptor in dealing with a structural feature suggested weakness when the material was really strong. Such laws of fitness should be obeyed. He called attention to the way in which sculpture was often placed in buildings in positions where it was impossible to properly see it, as in narrow streets. He also urged the importance of protecting sculpture from weather, and mentioned an interesting case in mediæval work where if an arm crossed a figure's chest it was inclined upwards to throw off the water and detached at the elbow so as to allow the water to escape. The exposure of statues on buildings by the French he disagreed with. He thought figure work in ceilings was a mistake.

A discussion followed in which Sir John Taylor, Prof. Beresford Pite, Mr. Hugh Stannus and Mr. John Belcher took part.

Competitions.

New Vicarage, St. Mary's, Rochdale.—The design of Mr. Jesse Horsfall, F.R.I.B.A., has been selected in limited competition.

Shire House, Norwich.—For additions to this building an open competition is to be held, with premiums of £100, £50 and £25.

Elementary School, Aylesbury.—In notifying the awards in this competition, on p. 264 of our issue for last week, the name of Mr. Alfred Hendy, of Nottingham, was inadvertently given as "Hendry."

Hospital for Infectious Diseases, Altrincham.—The design of Mr. W. Owen, of Manchester, has been selected in limited competition. Mr. Frank Briggs, F.R.I.B.A, of Liverpool, was the assessor.

Lambeth Municipal Buildings.—This competition has been won by Messrs. Warwick & Hall, of London (design No. 66); second premium (£200), Mr. H. P. Burke-Downing, London (design No. 75); 3rd premium (£100), Messrs. Crouch & Butler & Savage, Birmingham (design No. 94).

King's College Hospital.—The King's College Hospital Removal Committee, on the advice of their assessor, Mr. Rowland Plumbe, F.R.I.B.A., have awarded the first place in this competition to the design of Mr. W. A. Pite, F.R.I.B.A., who has been appointed architect for the new hospital, which is to be built at Camberwell. Five architects were invited to submit designs.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; 'O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending May 12th twenty-one failures in the building and timber trades in England and Wales were gazetted.

H. J. SHEPPARD, builder, Cheltenham. R.O. May 2nd.

J. T. MORRIS, builder, Newport, Mon. R.O. May 5th.

A. R. COOK, builder, Long Stratton. Adj. May 4th.

E. J. HODDINOTT, carpenter and builder, Milton. R.O. May 5th.

TATTON & FITZGERALD, timber merchants, Manchester. Adj. May 1st.

F. DALTON, joiner and builder, Buxton. R.O. May 2nd.

J. T. MCCHUNG, plumber, glazier and contractor, Manchester. P.E., Manchester C.C., June 5th, at 10.

A. HAIGH, painter and decorator, Mexborough. First meeting, O.R.'s, Sheffield, May 17th, at 12. P.E., Sheffield C.C., May 18th, at 2.

R. HUNT, builder and contractor, Sheffield. First meeting, O.R.'s, Sheffield, May 17th, at 1. P.E., Sheffield C.C., May 18th, at 2. Creditors unsecured £1,520; creditors fully secured £16,956.

ELECTRIC SAW MILL CO., Swansea. R.O. May 5th. P.E., Swansea Town Hall, May 19th, at 11.30. First meeting, O.R.'s, Swansea, same day, at 2.30.

W. HARRIS & SONS, LTD., builders' merchants, 339 to 343, Edgware Road, London. Liabilities £4,566; £3,374 expected to rank; estimated nett assets £2,923.

H. & F. FEARMAN, builders and decorators, London, E.C. Liabilities £915; £729 expected to rank; estimated nett assets £427. P.E. May 25th.

W. JOHNSON, plumber, Manchester. R.O. May 3rd. First meeting, O.R.'s, Manchester, May 17th, at 3.30. P.E., Manchester C.C., June 5th, at 10.

G. BECKER, merchant and timber broker, London. R.O. May 1st. First meeting, Bankruptcy Court, May 18th, at 11. P.E., same, June 7th, at 11.30.

T. M. VAUGHAN, builder, decorator, &c., Willesden. R.O. May 4th. First meeting, London Bankruptcy Court, May 18th, at 12. P.E., same, June 6th, at 11.30.

J. S. HANNAFORD, builder, Plymouth. First meeting, O.R.'s, Plymouth, May 18th, at 11. P.E., East Stonehouse Town Hall, June 1st, at 12.

A. GALE, builder and contractor, Fleet. First meeting, 24, Railway Approach, London Bridge, May 18th, at 12.30. P.E., Guildford Town Hall, June 13th, at 1.

J. J. BERRY, builder and contractor, Altrincham. First meeting, O.R.'s, Manchester, May 17th, at 3. P.E., Manchester C.C., June 5th, at 10.

A. E. MAGGS, carpenter, late speculating builder, Bristol. R.O. May 1st. First meeting, O.R.'s, Bristol, May 17th, at 11.30. P.E., Bristol Guildhall, June 2nd, at 12.

W. REYNOLDS, builder, Maidstone. R.O. May 2nd. First meeting, 9, King Street, Maidstone, May 17th, at 10.30. P.E., Maidstone Sessions House, same day, at 11.30.

Current Market Prices.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0	1	3	0
Clover, best	per load	3	15	0	4	2	6
Hay, good	do.	3	10	0	3	15	0
Sainfoin mixture ...	do.	3	10	0	3	17	6
Straw	do.	1	12	0	2	0	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ...	per cwt.	1	0	5		—	
Colza Oil, English ...	do.	1	3	9		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0		—	
Linseed Oil, barrels ...	per cwt.	0	19	6		—	
Petroleum, American ...	per gal.	0	0	$5\frac{1}{8}$		—	
Do. Russian ...	do.	0	0	$4\frac{5}{8}$		—	
Pitch	per barrel	0	8	0		—	
Shellac, orange	per cwt.	7	5	0	7	7	6
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	4	0	1	4	6
Tar, Stockholm	per barrel	1	6	6		—	
Turpentine	per cwt.	2	7	6		—	

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ...	per ton	79	0	0		—	
Iron, Staffs., bar ...	do.	5	15	0	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	7	6		—	
Lead, pig, Soft Foreign...	do.	12	16	3	12	17	6
Do. do. English common brands	do.	13	2	6	13	5	0
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14	0	0		—	
Do. pipe	do.	15	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	5	0		—	
Do. floor brads... ...	do.	9	0	0		—	
Steel, Staffs., Girders and Angles	do.	5	5	0	6	0	0
Do. do. Mild bars ...	do.	6	0	0	6	5	0
Tin, Foreign	do.	135	0	0	135	10	0
Do. English ingots ...	do.	136	0	0		—	
Zinc, sheets, Silesian ...	do.	28	0	0		—	
Do. do. Vielle Montaigne	do.	29	0	0		—	
Do. Spelter	do.	23	10	0	23	15	0

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Whitewood, American, logs	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	3	0
Fir, Dantzic and Memel	per load	2	10	0	4	15	0
Pine, Quebec, Yellow ...	do.	4	0	0	7	10	0
Do. Pitch, American	do.	2	8	0	5	0	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, Blankaholm Yellow, 1st, 4×9	per std.	11	10	0		—	
Do. do. do. do. 4×8	do.	10	15	0		—	
Do. do. do. do. 4×6	do.	9	5	0	9	10	0
Do. Mesane, White, 1st, 3×11	do.	13	5	0			
Do. Skelleftea, Yellow, 1st, 2nd & 3rd, planed ... 3×9	do.	9	5	0		—	
Do. do. do. do. do. 3×7	do.	8	0	0			
Do. do. do. do. do. 2½×8	do.	8	5	0		—	
Do. do. do. do. do. 2½×7	do.	8	5	0		—	
Do. do. do. 5th, 3×9	do.	9	0	0		—	
Do. Keret, Yellow, 2nd, 3×9	do.	13	10	0		—	
Do. Kovda, Yellow, 3rd, 3×9	do.	10	10	0		—	
Do. Archangel, Yellow, 4th, 3×9	do.	7	15	0		—	
Do. do. White, 1st, 3×9	do.	11	15	0		—	
Do. Gefle, Yellow, 3rd, 3×9	do.	11	10	0		—	
Do. St. Petersburg, Yellow, 1st, 3×9	do.	10	15	0		—	
Do. Rimouski, Bright Spruce, Unsorted, 3×9	do.	8	10	0		-	
Do. Quebec, Spruce, 3rd, 3×9	do.	8	10	0	8	15	0
Do. do. Bright pine, 5th, 3×11	do.	8	0	0		—	
Battens, all kinds ...	do.	6	0	0	13	0	0
Flooring Boards 1in. prepared, 1st... ...	per square	0	10	6		—	
Do. 2nd	do.	0	9	9		—	
Do. 3rd, &c.	do.	0	7	9	0	9	0

HARD WOODS.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	3	17	6	7	5	0
Birch, New Brunswick...	do.	2	10	0	5	0	0
Do. Quebec do. ...	do.	2	10	0	5	15	0
Box, Turkey	per ton	7	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	3½	0	0	3½
Do. Honduras ...	do.	0	0	3½		—	
Do. Tobasco	do.	0	0	$3\frac{3}{8}$	0	0	$4\frac{11}{16}$
Elm, Quebec	per load	4	0	0	8	10	0
Jarrah, planks	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras...	per ft. sup.	0	0	$4\frac{7}{32}$	0	0	$5\frac{1}{16}$

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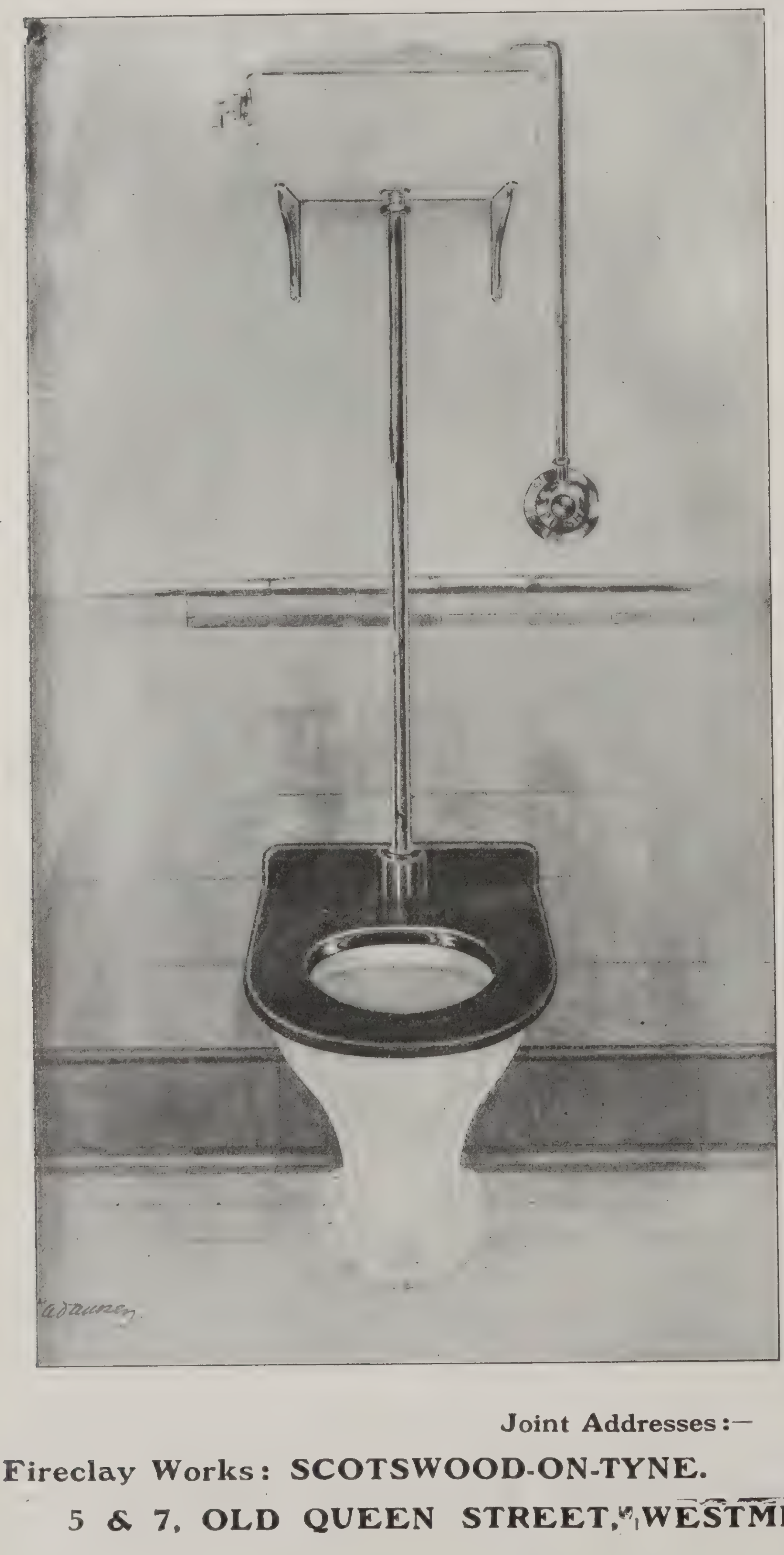

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Trade and Craft.

Terra-cotta.

Mr. Walwyn T. Chapman, of Grimsby Road, Cleethorpes, has just issued a new catalogue and price list of his stock patterns in terra-cotta details and moulded bricks. The diagrams are clear. All the articles can be supplied in buff or red terra-cotta at the same price. The number of designs included in this list is large and it is therefore of the greatest service to architects and builders alike. Mr. Chapman executes architects' designs with despatch, and the work produced by him is accurate in form and even in colour.

A Pipe Screwing Machine.

Messrs. Charles Winn & Co., of St. Thomas's Works, Granville Street, Birmingham, have made a speciality of high-class screwing machines for tubes or bolts for many years, and they have recently brought out a light compact pattern for a machine suitable for pipe-fitters' work, taking out to jobs, &c. This screwing machine has been designed to meet the demand for a lighter and cheaper tool, embodying the labour-saving features of the more expensive machines as far as is possible at the price, but the necessary economy has been effected without detriment to strength and durability, the best material being used throughout. The vice is self-centering and of novel design. It will hold firmly all sizes of tubes from $\frac{1}{4}$in. to 2ins. inclusive without splitting or distorting them; it will also hold $1\frac{1}{2}$in., $1\frac{3}{4}$in. and 2in. bends. Three dies are provided, each consisting of a set of four chasers of ample strength, to screw tubes of the sizes named, $\frac{1}{4}$in. to 2ins. inclusive, and these dies will screw the standard sizes when adjusted to the marking on the edge of the die-box; but they are adjustable, if required, to screw tubes larger or smaller in diameter than the standard size; while they can at any time be sharpened without softening by grinding upon a stone like an ordinary chasing-tool. There is no necessity to wind the machine backwards after screwing a thread, as an instantaneous releasing motion is provided, operated by loosening a nut at the back of the die-box. The machine is double-geared to give ease in working, and the driving lever is adjustable in stroke to provide a leverage suitable to the different diameters of the tubes being screwed, thus saving time; while it has been kept as light and compact as possible, and is therefore easily portable, the weight being under $1\frac{1}{2}$ cwts.

Builders' Notes.

The erection of the new Municipal Buildings at South Shields will be commenced shortly by the contractors, Messrs. Niell & Sons, of Manchester.

Newcastle Building Trade Dispute.—As the result of a meeting of masters and men convened by Mr. R. T. Leeson, architect, of Newcastle, a round-table conference has been decided on.

Messrs. Hahn & Co., importers of foreign hardwoods, 66, Mark Lane, London, E.C., have secured the Alexandra Wharf in North Woolwich Road, Tidal Basin Station, Victoria Docks, E., for storing their large and carefully-selected stock. This wharf has an area of about 140,000 sq. ft., with a long frontage to the Thames and a railway siding into the premises, so that trucks can be loaded and dispatched at once.

Dissolution of Partnership.—Messrs. Masters & Binning, master-plasterers and builders, of Middlesbrough, have dissolved partnership.

Employment in the Building Trades.—Wage-earners interested in the building trades attach great importance to the reports of the workers' organizations which are issued during May. The reports for the present month show an improvement in some branches of the trades, but their general purport is unsatisfactory to those who had hoped that the period between Eastertide and Whitsuntide would provide full employment

The Welsh Slate Industry and Tariff Reform.—In the course of a discussion which followed the reading of a paper on "The Tariff Question as affecting Wales" at Caxton Hall, Westminster, last week, under the auspices of the London Welsh Conservative and Unionist Association, it was pointed out that the slate industry in North Wales had been seriously affected by the dumping of cheap French and American slates. Before capital would be invested in Welsh slate quarries there must be some safe market for their products.

Bradford Builders and Corporation Contracts.—A movement is on foot in the Bradford building trade to secure that the Corporation shall not let contracts to contractors outside the city without compelling them to adhere to the fair contracts clause, as ratepaying firms in the city have to do. Contracts, it is stated, have been let to outside contractors who are not paying the standard rate of wages to their men. This puts a double hardship on the ratepayers, whether they are interested in the building trade or not. It means that Bradford men are out of work where they might otherwise be employed, and that practically a handicap is made in favour of firms outside the city.

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
May 18	Bradford–Synagogue	Hebrew Congregation	B. S. Jacobs, Lincoln's Inn Buildings, Bowlalley Lane, Hull.
,, 18	Paxford, Worcs.—Rebuilding Bridge	Highways & Bridges Committee.	J. H Garrett, Shire Hall, Worcester.
,, 19	Broad Oak—Church	—	J. E. Bowen, 78 Monnow Street, Monmouth.
,, 19	Chartham, Kent—Repairs, &c., to Wards	Committee of Lunatic Asylum	W. J. Jennings, 4 St. Margaret's Street, Canterbury.
,, 20	Cardiff—Bandstand	Corporation	W. Harper, Town Hall, Cardiff.
,, 20	Grampound, Cornwall—Alteration to School	—	F. C. Jury, 1 Alma Villas, Tregonissey Road, St. Anstell.
,, 20	Bilston—Boys' School	Urban District Council	F. M. Cooper, Education Offices, Town Hall, Bilston.
,, 20	Hampton, near Evesham—Rebuilding Bridge	Highways and Bridges Committee.	J. H. Garrett, Shire Hall, Worcester.
,, 20	Ebbw Vale—Chapel and Schoolroom	Trustees of Nebo Baptist Church	H. Waters, Beaufort.
,, 22	Newcastle—Baths and Washhouses	Corporation	City Property Surveyor's Department, Town Hall, Newcastle.
,, 22	Chelmsford—Block of Buildings at Hospital	Joint Hospital Board	A. S. Duffield, 96 High Street, Chelmsford.
,, 22	Antwerp—Exhibition Hall	Commercial Intelligence Branch of Board of Trade.	Offices of Branch of Board of Trade, 73 Basinghall Street, E.C.
,, 22	Gorseinon—Villa Residence	—	C. T. Ruthen, Bank Chambers, Heathfield Street, Swansea.
,, 23	Thornaby-on-Tees, Yorks—Chancel Work	—	Vicarage, Thornaby-on-Tees.
,, 23	Warlingham, Surrey—Pavilion	Visiting Committee of Hospital.	G. F. Carter, Town Hall, Croydon.
,, 23	Baildon—Villa	—	J. H. Bakes, Calverley Chambers, Victoria Square, Leeds.
,, 24	Marple Bridge, near Stockport—Lock-up	Standing Joint Committee	J. F. Storey, County Offices, St. Mary's Gate, Derby.
,, 24	London, N.W.—Conversion of Building into Conveniences	London County Council	Architect's Department, 16 Pall Mall East, S.W.
,, 24	Gillingham—Chapel, &c.	Corporation	E. J. Hammond, 21 Balmoral Road, Gillingham.
,, 24	Ramsgate—Lock-up Shop	Corporation	E. C. Byrne, Albion House, Ramsgate.
,, 25	Carharrack—Wesleyan School	—	Sampson Hill, Green Lane, Redruth.
,, 25	Nelson, Lancs—Market Stalls	Market and Library Committee.	B. Ball, Borough Engineer, Nelson.
,, 25	Porth, Wales—Conversion of School into One Department	Education Committee	J. Rees, Hillside Cottage, Pentre.
,, 26	Aldeburgh, Suffolk—Engine-house	Corporation	J. C. Gordon, Aldeburgh.
,, 26	Warrenpoint—Erecting and completing Orange Hall	—	S. W. Reside, Margaret Square, Newry.
,, 26	Aston Manor—Urinal	Town Council	Borough Surveyor, Council House, Aston Manor.
,, 26	Manchester—School	Education Committee	W. Talbot, Town Clerk, Manchester.
,, 26	Wortley—Caretaker's Cottage	Rural District Council	G. E. Beaumont, Greenside, near Sheffield.
,, 27	Felling, Durham—Additions to School	Urban District Council	H. Millar, Council Buildings, Felling.
,, 27	Sheffield—Hospital	Guardians	H. I. Potter, 24 Norfolk Road, Sheffield.
,, 30	London, E.—Library	Leyton U.D.C.	W. Jacques, 2 Fen Court, Fenchurch Street, E.C.
,, 31	Bury—Pulling-down Old Market	Corporation	Borough Engineer, Bury.
June 1	Pontefract—Completion of Cottage Homes	Guardians	Garside & Pennington, Pontefract.
,, 3	Dublin—Training College Building	Commissioners	J. F. Fuller, 179 Great Brunswick Street, Dublin.
,, 3	Beverley—Infants' School	Education Committee	Hawe & Foley, North Bar Street, Beverley.
,, 3	Glasnevin, Ireland—Residence	Commissioners	J. F. Fuller, 179 Great Brunswick Street, Dublin.
	ENGINEERING:		
May 18	Grimsby—Dredging	Great Central Railway Co.	Company's Resident Engineer's Office, Grimsby Docks.
,, 19	Bridgnorth—Bridge Works	—	Borough Surveyor, Bridgnorth.
,, 20	Keighley—Superheaters	Electricity Committee	J. M. Smyth, Electricity Works, Keighley.
,, 20	Weston Subedge—Waterworks	Pebworth R.D.C.	E. Wadams, Union Offices, Evesham.
,, 22	Glasgow—Electric Arc-light Installation	Clyde Navigation Trustees	G. H. Baxter, Mechanical Engineer, Clydebank Dock, N.B.
,, 22	Newcastle—Boilers, &c.	Finance Committee	City Property Surveyor's Department, Town Hall, Newcastle.
,, 22	Colchester—Main-laying	Corporation	C. E. Bland, Town Hall, Colchester, St. Leonards.
,, 22	Hastings—Heating Apparatus	Education Committee	C. A. Pigott, Saxon Chambers, London Road.
,, 23	Buntingford, Herts—Well	Rural District Council	J. Chadwick, Bletchley, Bucks.
,, 23	Antwerp—Bridge	—	M. le Directeur-Général, Société National des Chemins de fer Vicinaux 14 Rue de la Science, Brussels.
,, 24	Aldeburgh—Pumping Machinery	Corporation	J. C. Gordon, Aldeburgh.
,, 24	Dartford—Boiler, &c.	Urban District Council	W. Kay, Council Offices, Dartford.
,, 24	Aldeburgh—Pumping Machinery	Corporation	J. C. Gordon, Aldeburgh.
,, 24	London, N.—Conveying Plant	Islington Borough Council	Electrical Engineer, 50 Eden Grove, Holloway, N.
,, 24	Millom—Sulphate Plant	Urban District Council	W. T. Lawrence, Council Offices. Millom.
,, 24	Sheerness-on-Sea—Main-laying	Sheppy Gas Co.	H. Barber, 2 Trinity Road, Sheerness-on-Sea.

Complete List of Contracts Open.—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	ENGINEERING—*cont.*		
May 25	Scunthorpe—Reservoir	Urban District Council	A. M. Cobban, Home Street, Scunthorpe.
,, 25	London, N.E.—Artesian Well	Hackney Borough Council	R. Hammond, 66 Victoria Street, S.W.
,, 27	Bangour, N.B.—Electric-light Plant	District Lunacy Board	H. J. Blanc, 25 Rutland Square, Edinburgh.
,, 29	Roa, Spain—Waterworks	——	Offices of the Secretary of the Ayuntamiento, Roa.
,, 29	Kettering—Lamps, &c.	Urban District Council	John Bond, Council Office, Kettering.
,, 30	Sydney, New South Wales—Refuse Destructor	Municipal Council	Acting Agent-General for State of New South Wales, Victoria St., S.W
June 1	Glasgow—Machinery	Corporation	Office of Public Works, City Chambers, 64 Cochrane Street, Glasgow.
,, 2	Northam, Herts—Sinking Well, &c.	Gas and Water Co.	T. H. Martin, Station Road, New Barnet.
	IRON AND STEEL:		
May 18	Egham—Iron Fencing	Rural District Council	W. Menzies, Englefield Green, Surrey.
,, 22	Barking—Pipes	Gas Co.	W. B. Reidie, Manager, Gas Committee, Barking.
,, 22	Leeds—Wrought-iron Tubes	Corporation Gasworks	R. H. Townsley, Gas Offices, East Parade, Leeds.
,, 22	London, W.—Girder Work	Great Western Railway Co.	Engineer, Paddington Station, W.
,, 30	Sydney, Australia—Iron and Steel	——	Agent-General's Office, 9 Victoria Street, S.W.
Sept. 1			
	PAINTING AND PLUMBING:		
May 18	Manchester—Interior Painting at Union Offices	Guardians	Porter, Union Offices, Manchester.
,, 20	Skipton—Repairing and Painting Street Lamps	Urban District Council	J. Mallinson, Town Hall, Skipton.
No date	Newcastle-on-Tyne—Painting Schools, &c.	Education Committee	A. Goddard, Education Offices, Northumberland Road, Newcastle.
	ROADS AND CARTAGE:		
May 18	Newport, Mon.—Road Materials	County Council	County Council Offices, Newport.
,, 22	Ely—Road Materials	Urban District Council	City Surveyor's Office, Ely.
,, 22	Milton-next-Sittingbourne—Norwegian Kerbing	Urban District Council	W. R. Darlow, Town Hall, Milton-next-Sittingbourne.
,, 22	Stevenage, Herts—Granite	Urban District Council	Council Offices, Stevenage, Herts.
,, 22	Poole—Granite	Town Council	John Elford, Borough Offices, Poole.
,, 23	London, N.—Tar Paving	Islington Borough Council	J. P. Barber, Town Hall, Upper Street, N.
	SANITARY:		
May 20	Windsor—Sewerage Works	Rural District Council	A. M. Fowler, 1 St. Peter's Square, Manchester.
,, 20	Carlisle—Removal of Ashes	Rural District Council	The Clerk, 7 Victoria Place, Carlisle.
,, 23	Epsom—Sewerage Works	Rural District Council	Council Offices, Waterloo Road, Epsom.
,, 24	Carlton, near Nottingham—Sewers, &c.	Urban District Council	J. C. Haller, Surveyor's Office, Carlton.
,, 24	Rugby—Drain	Urban District Council	D. G. Macdonald, Surveyor, Rugby.
,, 26	Burslem, Staffs—Sewage-disposal Works	Corporation	F. Bettany, St. John's Chambers, Burslem.
,, 30	Bootle, Lancs—Sewer	Corporation	B. J. Wolfenden, Borough Engineer, Bootle.
,, 30	Christchurch, Hants—Sewerage Works	Corporation	E. J. Legg, Town Hall, Christchurch.
	TIMBER:		
May 20	Manchester—Timber	Education Committee	Offices, Deansgate, Manchester.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
May 24	Harrogate—Orphanage	——	10s.	Rev. J. T. Barkley, Riche Mont, Harrogate.
,, 24	Windsor—Hospital	£50	£1	J. E. Gale, 3 Sheet Street, Windsor.
June 1	Donegal—Lighting Scheme	——	——	D. C. Pearson, Clerk, Donegal.
Aug. 1	Perth—Reconstruction of Hall	30, 20 and 10 guineas	——	J. Begg, City Chambers, Perth.
,, 1	Perth—Erection of new Hall	50, 30 and 20 guineas	——	J. Begg, City Chambers, Perth.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

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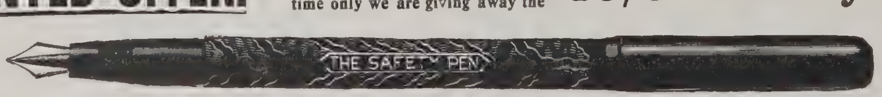

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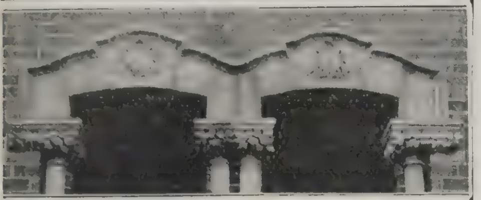

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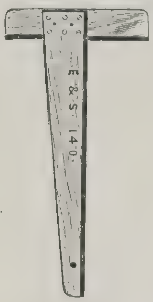
No. 3 List. Drawing Boards, T Squares and Set Squares.
No. 4 List. Drawing and Tracing Paper, Tracing Cloth, &c.
No. 5 List. Inks, Water Colours, Paints, Brushes, &c.

LIST No. 3.

English Shaped T-Squares.



BEST MAHOGANY POLISHED T-SQUARES,

Extra Finish, Ebony Edged, Pegged and Keyed.

No. 140.

Length			Price	
Length,	12 in.	taper blade,	**1/6**	each.
,,	18 in.	,,	**2/6**	,,
,,	24 in.	,,	**3/-**	,,
,,	31 in.	,,	**3/6**	,,
,,	36 in.	,,	**4/6**	,,
,,	42 in.	,,	**5/6**	,,
,,	48 in.	,,	**6/-**	,,
,,	54 in.	,,	**8/-**	,,

DRAWING BOARDS.

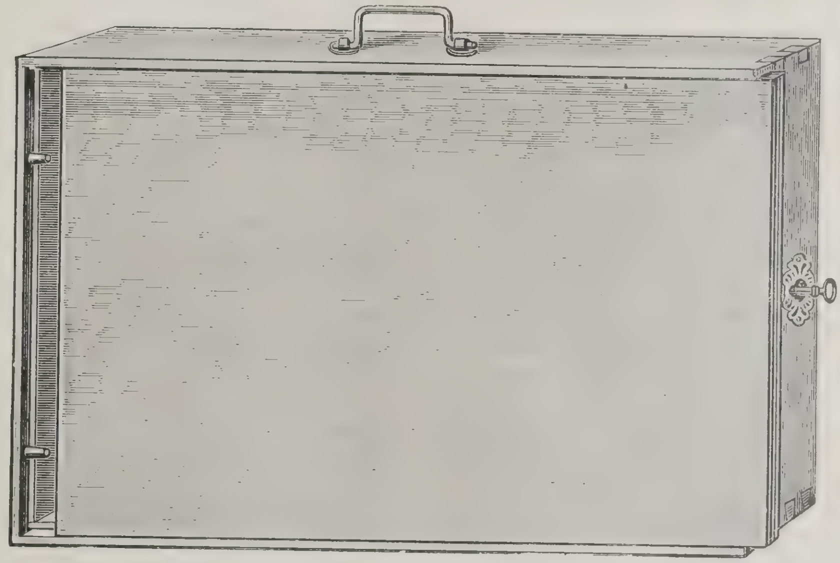
No. 151.

Each Board is stamped "E. & S. Triplex, 151."

Inches.		Each.
13 × 9½	Imperial 4to	**1/-**
16 × 11½	Imperial 4to (full size)	**1/6**
17 × 10½	Half Royal -	**1/6**
19 × 13½	Half Imperial	**1/9**
20 × 15½	Medium -	**2/-**
23 × 16	Half Imperial size)	**2/3**
22 × 17	Royal - -	**2/3**
24 × 19	Half Double Elephant	**3/-**
28 × 19	Imperial -	**3/9**
30 × 22	(Special) -	**4/6**
31 × 23	Imperial (full size)	**5/-**

BOX DRAWING BOARD. Price 5/6.

No. 170 F.

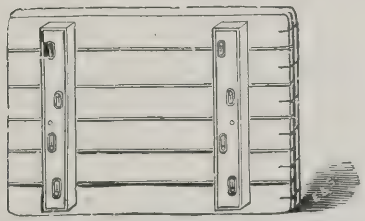


Outside Measurements—23⅜″ × 16¾″ × 2½″

Box Drawing Board with strong lock and key, the lid being the well-known "Triplex" Drawing Boards Size 23 × 16 in. This is a most useful and necessary article in which students can keep their scales and instruments, &c

ENGINEERS' & ARCHITECTS' DRAWING BOARDS.

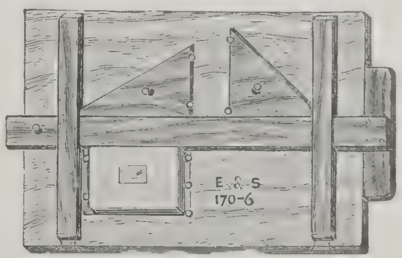
No. 144.



These Boards are made from best seasoned pine, grooved with mahogany battens, brass slots and screws to allow of contraction. One edge inlaid with ebony.

Size	Price
23 × 16 in., Royal -	**7/-**
28 × 21 in., Imperial -	**9/6**
32 × 23 in., Imperial (full)	**12/6**
42 × 29 in., Double Elephant	**16/-**
54 × 32 in., Antiquarian	**25/-**

DRAWING SETS.



Set No. 170B.

The "Student's Own" Drawing Set, comprising drawing board (size 23 × 16), 24 in. T-square, 2 large set squares, 12 drawing pins, and set of instruments in rosewood hook case, comprising 4½ in. brass divider, needle-pointed compass with pen and pencil points, bar, patent pencil point, box of leads, slip rule, and pencil holder, **7/6** each.

The above Prices include Postage within the United Kingdom.

Remittances and Orders should be addressed to
THE BUILDERS' JOURNAL SUPPLY DEPARTMENT,
Builders' Journal Office, Great New Street, Fetter Lane, E.C.

Advertising Notes.

The Japs are little pocket-editions of men, but there's a full-sized cyclone wrapped up in every one of them. Advertisement space may be small like the Jap, but if it is filled with pungency instead of palaver and ginger instead of jam it will git there every time.

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterward, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Monday.

A QUANTITY SURVEYOR (experienced as Builders' Surveyor) is willing to arrange with Builders to do their work. Quantities, estimating, adjustment of accounts, &c. References to £100,000 last 15 months.—H. H. H., 10, Queen Square, Bloomsbury. W.C. 1118

ARCHITECT and SURVEYOR'S ASSISTANT desires engagement. Good draughtsman. Working and detail drawings. Reference from present office.—W. H. Ellison, Senior and Clegg, Architects, Barnsley. 1090

ARCHITECT and SURVEYOR'S ASSISTANT desires RE-ENGAGEMENT. Ten years' first-class experience. Thoroughly qualified in general and detail drawings, specifications and quantities. Neat and quick draughtsman. Excellent testimonials.—Alpha, 9, St. Mark's Road, Bush Hill Park, Enfield, N. 1106

ARCHITECT and SURVEYOR'S ASSISTANT, disengaged (25); experienced. Working drawings, quantities, measuring up, specifications, surveying and levelling.—15, Kennington Park Gardens, London, S.E. 1115

ARCHITECT and SURVEYOR'S ASSISTANT, 20 years good general experience, desires ENGAGEMENT; references; moderate salary.—W., 13, Fordel Road, Catford, S.E. 1125

ARCHITECT and SURVEYOR'S Assistant desires ENGAGEMENT. 3½ years' varied experience. Good draughtsman, surveying and levelling, &c.—Apply, A.B., 48, Thornton Avenue, Chiswick. 1123

ARCHITECT and SURVEYOR'S ASSISTANT desires ENGAGEMENT. Ten years' experience in all branches of the profession, including quantities, specifications, &c. Splendid testimonials.—Apply Box 1105, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S ASSISTANT desires ENGAGEMENT. Eight years' experience. Good draughtsman. Working drawings, details, &c. Salary 35s.—D., 85, Waterloo Road, Leyton, E. 1119

ARCHITECT'S ASSISTANT (27,) disengaged. Able draughtsman. Working drawings, designs, details, specifications, dilapidations, &c. Good references. Salary 3 guineas. — Reply, Box 1117, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S ASSISTANT (24) requires situation. Working drawings, details, surveying, assistance with quantities, routine. Moderate salary.—Box 1138, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S ASSISTANT requires engagement. 5 years' experience. Contract drawings, quantities, specifications, &c., shorthand.—L. J. Dolman, Repton, Burton-on-Trent. 1139

ARCHITECT'S ASSISTANT (24). Nine years' good experience. First-class draughtsman, well up in design, working drawings, details, perspectives. —W. H. L., 116, Sugden Road, Clapham Common, S.W. 1089

ARCHITECT'S JUNIOR ASSISTANT desires ENGAGEMENT. Good training in domestic work.—Hodgson, 1, Branksome Terrace, Bournemouth. 1094

ARCHITECT'S JUNIOR ASSISTANT desires ENGAGEMENT in London Office.—Apply Box 1102, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S JUNIOR ASSISTANT desires ENGAGEMENT; seven years' varied experience; London and Provincial; assistant.—Englehome, Southbourne Road, Bournemouth. 1144

ARCHITECTURAL DRAUGHTSMAN, twelve years' general experience in good offices. Good refs. Salary, 2 guineas.—Box 1112, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

BRICKLAYER, good, requires SITUATION; references.—B. Wharrie, Wainfleet Bank, Lincolnshire. 1107

BRICKWORK and POINTING wanted by practical man. Rod or Job. Good refs.—L. H., 7, Newton Road, Isleworth. 1091

BUILDER'S ASSISTANT (38), desires Re-engagement. Management or to assist principal. Life experience with London and Provincial Builders. Moderate salary for permanency. Exceptional references including present employer. Competent, energetic, of good address and capable of improving a business.—Alpha, Grasmere Cottage, Ware. 1099

BUILDER'S ASSISTANT desires ENGAGEMENT. Well up in accounts, prime cost, measuring, and usual office routine. Assist estimating and quantities.—F. J. L., 53, Maidstone Road, Chatham. 1134

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BUILDER'S CLERK DISENGAGED. Prime cost, accounts, book-keeping, quantities, drawing, and usual routine. Sixteen years with last employer. Moderate salary for permanency.—S. E., 183, The Grove, Hammersmith. 1140

CARPENTER and JOINER (23), 9 years' experience. seeks constancy; country preferred; life abstainer.—G., 20, Woodhouse Grove, East Ham, Essex. 1121

CLERK, BOOKKEEPER, &c. — Position required by practical man, aged 30; single. Experience in Engineers', Builders' and Contractors' offices and works. Recommended by London chartered accountants. London or provincial town. — Address Henry Marshall, 12, Gowland Place, Beckenham, Kent. 1108

GENERAL FOREMAN wants JOB. New or alteration; 11 years with last employers; good manager of men; well up in drawings and quantities. Trade, bricklayer, age 41.—A. B., 48, Farley Road, Catford, S.E. 1093

GERMAN ARCHITECT, who has also passed Engineer's examination, desires ENGAGEMENT. Eight years' experience of all branches. Thoroughly practical. Moderate salary. Excellent references.—Lassen, Birchbank, Christchurch Road, Hampstead. 1101

PLASTERING WANTED (piecework). Labour only. Town or country. Any patent. Best references.—C. W. S., 95, Overbury Street, Clapton Park, N.E. 1135

PLUMBER, Gas, Hot Water, &c., wants Situation. Could take charge or any place of trust. Age 48; life experience; highest testimonials.—H. T., 114, Wycliffe Road, Battersea. 1141

WORKING FOREMAN PLUMBER (R.P.) wants job or constancy; well up in latest sanitary and lead laying work; state wages.—G. Brant, Dale Street, Chatham. 1142

Appointments Vacant.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterward, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Monday.

A FIRM OF CONSTRUCTIONAL ENGINEERS require a REPRESENTATIVE in each of the following places: SouthWales, Newcastle and district, London, and Sheffield. Only firms who have a good connection with Engineers, Architects, and Builders need apply. The Agency will be based on a Commission for all work coming through their districts.—Apply, Box 1129, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

BUILDER'S CLERK.—WANTED at once in Midland Town. Must be quick and accurate with accounts. One with a good knowledge of quantities and drawings preferred Permanency to a good man. Must forward with application testimonial from present employer. State age and salary required.—Apply Box 1131, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

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WANTED in a small town (south), BUILDER'S ASSISTANT to manage branch business, thoroughly reliable, strictly sober, must understand every branch connected with the building trade; state age and salary required.—Apply Box 1133, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

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ARCHITECTS. Wanted PARTNERSHIP in first-class business; must be genuine; amount up to £500. State income and all particulars.—Address, Box 1098, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

YOUNG ARCHITECT, 10 years' London and provincial experience, of artistic and practical ability, desires ENGAGEMENT with Architect with a view to purchasing Junior Partnership. Highest references from some of the most influential members of the profession. Speciality: Domestic work.—Apply, Box 1124, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

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TRACINGS, First Class. Spare time evenings.—Write, R. L. Sivyer, 20 Cowley Street, Westminster. 1136

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FIRST-CLASS MONUMENTAL BUSINESS for SALE in a flourishing town in the Midlands. Reason for selling too far away.—Particulars of H. H. Sale, Architect, 11, Silver Street, Bedford.

HASTINGS. IRONMONGER'S BUSINESS for DISPOSAL; large shop with house, centre of town. Returns £2,000, good profits; stock at valuation. Satisfactory reason for selling.—Apply, St. John and Kent, 18, London Road, St. Leonard's-on-Sea.

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LIFTS.—WM. AUG.'S GIBSON, Ltd., formerly President of American Elevator Co., later Managing Director Otis Elevator Co., Ltd. Temple Bar House, 28, Fleet Street, London, E.C.

ALFD. S. TUCKER'S ALABASTER AND MARBLE WORKS, 143½, Euston Road, N.W. Telephone: 2955 Central.

BUILDING LAND to be let on LEASE for a LONG TERM in North Hill, Highgate. —Apply to Mr. Alfred Burr, Architect, 85, Gower Street, W.C.

GRANO-CONCRETE WORK.—WANTED by Practical and Reliable man castings of every description: Situ Stairs, Paving, Fireproof Floors, Partitions, &c.; labour only or would take charge.—E. E., 48, Reaston Street, New Cross, S.E. 1143

KENT JOINERY WORKS, Delf Street, Sandwich. Joinery of all kinds. Sound, reliable English-made goods. Doors, Frames, Sashes, &c., at lowest prices.

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POLING BOARDS, selected lengths and thicknesses (best quality and full measure).
Also Scaffold Boards, Putlogs, Scantlings, Deals, Battens, and Boards. Lowest wharf prices.
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TO FLAT AND VILLA BUILDERS.—Special cheap line in internal fire resisting partitions; room saving and sound proof.—Address, Partitions, 60, Watling Street, London, E.C.

SEE PAGES XVII and XXII FOR EMPLOYMENT REGISTER.

WORKING or COMPETITION DRAWINGS, PERSPECTIVES, TRACINGS,
PHOTO-COPIES, All kinds of copies, including PERMANENT BLACK LINE on CARTRIDGE or LINEN. **MODELS** OF BUILDINGS, WORKS, ETC., **LITHO-PRINTING.**
THE LONDON DRAWING & TRACING OFFICE, (Estd. 1883.) **98, Gray's Inn Road, W.C.** (Adjoining Holborn Town Hall.)
Telephone, No. 1011 HOLBORN. *Manager*—JOHN B. THORP. Telegrams: "DIVIDITORE," LONDON.

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E. C. HUGHES,
Builder and Contractor,
Albion Works, Wokingham.

Recent Work:
CHILDREN'S HOMES, Farnborough. £13,600.
Messrs. Holman & Goodrham, Archts., London.
HOTEL and SHOPS, Henley-on-Thames. £12,700.
W. Theobald, Esq., Architect, London.
POLICE STATION and COURT ROOMS, Wokingham. £5,600.
J. Morris & Son, Architects, Reading.
ALTERATIONS and ADDITIONS at The Coppice, Shiplake. £6,000. For Justice Sir W. G. F. Phillimore, Bart.
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WORKHOUSE ALTERATIONS and ADDITIONS, Easthampstead. £6,500.
Chas. Smith & Son, Architects, Reading.

Educational.

LAND SURVEYING and LEVELLING, including use of THEODOLITE. My annual course of 16 Lessons, comprising 8 Lectures (Fridays) and 8 Field Lessons (Saturdays) will commence on May 12th. Number of students limited. Fee £2 2s. Also 8 Lectures on Practical Sanitary Science (Tuesdays). Fee 12s. 6d.—For full particulars apply to J. Lawrance, jun., M.R.S.I., A.I.S.E., 112, Shirland Road, W.

QUANTITIES.—A course of Correspondence Lectures in this subject (on the London system) is now ready. Also Lectures in Estimating.—For particulars apply Box 632, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

R. I.B.A. EXAMS. — Personal and Correspondence tuition; courses of any duration. Apply for syllabus to Mr. A. G. Bond, B.A. Oxon., A.R.I.B.A., 115, Gower Street, London, W.C. (late Howgate and Bond).

TO ARCHITECTS AND STUDENTS.—Student has the following BOOKS for Sale at a reasonable offer for single works or the whole. Pugin's Examples of Gothic Architecture, 3 vols., 2nd edition, 221 plates, 9½ ins. by 12½ ins.; Clutton's Medieval Architecture, 16 plates, 12½ in. by 18 in., including two of the Staircase at Blois Pub. 1856 (slightly damp stained); Kelly's Practical Masonry, 1838, 45 plates, 8½ ins. by 11 ins.; Brook's Cottage and Villa Architecture, 110 plates, 11 ins. by 8½ ins.; House for the Suburbs, 2nd edition, Morris, 9 ins. by 6 ins.—Box 1110, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

R.I.B.A., AND ALL TECHNICAL EXAMINATIONS.—Preparation by Correspondence or personally. First place on 29 occasions in open competition.—G. A. T. Middleton, 19, Craven Street, Strand, W.C.

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Correspondence Classes specially for Architects, Assistants, Surveyors, Builders, and Draughtsmen, by the Midland Engineering Bureau, Strand, Derby. Specialists in American and Continental Construction. Thorough Tuition. Send for descriptive booklet J., and read opinions of past students, and press notices, &c.

EMPLOYMENT REGISTER.

Too late for Classification.

1135.—Plastering wanted. Labour only. Town or country. Best refs. Any patent.
1136.—First-Class Tracings done in spare time and evenings.
1137.—Designer with wide exp. in tile and faience.
1138.—Architect's Assistant (24), working drawings, details, surveying, quantities; mod. s.
1139.—Architect's Assistant, 5 yrs. exp. Contract drawings, quantities, specns., shorthand.
1140.—Builder's Clerk. P.C. accounts, book-keeping, quantities, drawing, &c.; 16 yrs. in last berth; mod. s.
1141.—Plumber, Gas and Hot-Water, &c. Can take charge; age 48; life exp.; highest refs.
1142.—Working Foreman, Plumber; experienced in sanitary and lead laying work.
1143.—Grano Concrete Work wanted. Castings, *situ* stairs, paving, fireproof floors, partitions. Labour or to take charge.
1144.—Architect and Junior Assistant; 7 yrs. varied exp. in London and Provinces.

See p. xxii *for the Employment Register.*

Contracts Open.

RUGBY URBAN DISTRICT COUNCIL.

TO CONTRACTORS.

The above Council invite TENDERS for the CONSTRUCTION of a MAIN OUTFALL SURFACE WATER DRAIN about 600 yards in length commencing at the 36 in. Culvert in Mill Road, thence across the Cattle Market and along Wood Street as far as Lodge Road, together with the Manholes and other Works connected therewith, the Plans, Specifications and Conditions of Contract can be seen at the office of the undersigned, where also copies of the Bill of Quantities and form of Tender can be obtained by intending Contractors on and after WEDNESDAY, the 10th inst., on payment of £1, which sum will be returned on the receipt of a bonâ fide tender. Tenders on the Form prescribed endorsed "Main Drain," to be sent to T. M. WRATISLAW, Esq., Clerk to the Council, High Street, Rugby, on or before the 24th inst.

The Council do not bind themselves to accept the lowest or any Tender.

By Order,
D. G. MACDONALD, Assoc. M.Inst. C.E.,
Surveyor to the Council.
Rugby, May 4th, 1905.

CONTRACTORS.

TENDERS are invited for the Erection and Completion of a Block of Dwelling-houses, Clowney Street, Glasgow.

Plans, specifications, and particulars of the work can be obtained at my office.

The lowest or any tender not necessarily accepted.

W. J. MOORE, Architect,
Royal Chambers, 35, Royal Avenue Belfast.

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One of the holders of The Builders' Journal Insurance Policies has just received the sum of £6 in settlement of an accident claim.

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To Contributors.

The Editor will be pleased to consider any articles, illustrated or otherwise, dealing with old and new buildings, methods of construction, or other matter of an architectural character. He will also be glad to consider architectural photographs and sketches (the latter preferably in black and white) and measured drawings of work in this country or abroad. News items of interest to architects and builders will also be considered, provided the name and address of the sender are given; no notice will be taken of anonymous contributions. All communications should be addressed to the Editor of The Builders' Journal, 6, Great New Street, E.C.

Privileges open to all Regular Readers of the "Builders' Journal."

I.—Free Monthly Advertisements.

1. A Free Advertisement of 12 words in the Wanted or Miscellaneous Advertisement Columns, in one issue of the Builders' Journal during each calendar month will be given to any regular reader.

2. The charge of one penny will be made for each additional word.

3. Advertiser's Name and Address or Box Number must be counted, but will in no case be reckoned as more than five words.

4. All advertisements must be accompanied by the correct remittance, and should a receipt be required a stamped addressed envelope must be enclosed.

5. The Proprietors reserve to themselves the right of refusing any advertisement.

II.—Free Answers to Enquiries.

1. The services of a large staff of experts are at the disposal of all regular readers who require information on architectural, constructional or legal matters.

2. Questions should in all cases be addressed to the Editor, and be written on one side of the paper only.

3. Correspondents are particularly requested to be as brief as possible.

4. The querist's name and address must always be given, not necessarily for publication

Note.—Owing to the large number of enquiries we receive weekly, we are compelled to restrict the advantages of this department to Regular Readers.

III.—Free Accident Insurance of £500.

1. Every regular reader of the Builders' Journal is entitled to the benefit of this Insurance.

2. A Pamphlet giving full details of this and other Insurance schemes inaugurated by the Builders' Journal for the benefit of its readers, and guaranteed by "The Ocean Accident Corporation, Limited," will be sent on application.

What is a Regular Reader?

We have employed the term "Regular Reader" throughout these announcements as the description "subscriber" is often understood to mean one who subscribes direct to the publishing office.

We mean by a Regular Reader anyone who has placed an order with us or any newsagent or bookstall for the Builders' Journal for one year.

Those readers who order the Builders' Journal through their local newsagent or bookstall should send us the newsagent's receipt. Their names will then be placed on our subscribers' list, and they will be entitled to all the advantages set out above.

5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS.
OFFICE: 6, GREAT NEW STREET, FETTER LANE, E.C.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Addiscombe (Croydon).—For the erection of a billiard-room at St. James's Lodge. Mr. H. Ling, architect, 31, Charing Cross, S.W. Quantities supplied :—

Hayward & Son	£1,365
Maides & Harper	1,325
Hollingsworth	1,263
Hanscomb & Smith	1,258
Page & Son	1,199
Marriage*	1,145

* Accepted.

Banbury.—For first portion of contract for the erection of new business premises on Cornhill. Mr. A. Edward Allen, architect, 31A, Bridge Street, Banbury Quantities by architect :—

J. S. Kimberley	£1,153
W. J. Bloxham	1,127
S. Orchard & Sons	1,111
J. Grant & Sons	1,057
J. F. Booth,* Banbury	1,040

* Accepted.

Barnard Castle.—Accepted for the erection of detached residence, conservatory, boundary-walls, gates, &c., for Mr. A. Steele. Mr. T. Farrow, architect, 7, Market Place, Barnard Castle. Quantities by architect :—

C. Martin, 3, Longfield Terrace, York.

[Eleven tenders received.]

Bristol.—For the erection of St. Silas Sunday school and mission-hall. Messrs. Lingen Barker & Son, architects :—

W. Cowlin & Son	£1,520
D. Clark & Sons	1,452
E. Walters & Son	1,442
A. J. Beaven	1,399
C. A. Hayes	1,375
R. Wilkins & Sons*	1,369

* Accepted. [All of Bristol.]

Chipping Sodbury.—For the erection of board-room, &c., for the Guardians. Mr. A. Roach, architect, Charfield :—

J. Hatherley, Bristol	£2,775	0	0
Hawkins & Sons, Rudgeway	2,718	16	0
Denty & Co.	2,659	0	0
H. A. Forse & Sons	2,590	0	0
E. Clark & Sons, Fishponds	2,545	0	0
P. Ford & Sons, Stroud	2,440	0	0
Orchard & Peer, Stroud	2,410	0	0
Lovell & Sons, Bristol	2,400	0	0
Walters & Sons, Bristol	2,393	0	0
S. F. Simmonds, Rangeworthy	2,359	13	6
J. Long & Sons, Bath	2,283	0	0
Adams & Jefferies,* Oldland, near Bristol	2,230	0	0

* Accepted.

Compton (Hants).—For additions to All Saints' Church. Messrs. John B. Colson, F.R.I.B.A., and G. H. Kitchin, 45, Jewry Street, Winchester, joint architects :—

Grace & Son, Clatford, Andover	£3,630
Beale, Andover	3,379
Stevens & Co., Southampton	3,360
Fielder & Son, Winchester	3,335
Weeks	3,329
Green	3,215
Franklin & Co., Southampton	3,196
Musselwhite & Sapp, Basingstoke	3,178
Wise & Co., Winchester	3,170
Goddard & Son, Farnham, Surrey	3,094
Jenkins & Son, Southampton	3,075
Golding & Ansell	2,938
Bascomb, Winchester.*	

* Withdrawn.

Note.—No tender yet accepted.

Gateshead.—For the erection of stables at Tyne Road East, for the Corporation. Mr. N. Percy Pattinson, borough surveyor :—

Veitch & Sons, Newcastle	£5,192	2	10
S. F. Davidson, Newcastle	4,819	9	4
S. Fenwick & Co., Newcastle	4,800	5	0
J. Johnson, Boldon	4,714	0	0
W. E. Hall, Low Fell	4,627	6	11
W. Hall	4,550	2	2
W. Nicholson, Gosforth	4,516	2	0
W. S. Stout	4,513	12	5
W. Kennedy, Jarrow	4,460	0	0
Turner & Co.	4,400	18	10
E. T. George, Newcastle	4,371	0	0
T. Hunter, Washington	4,325	13	0
W. Worby, junr., Benwell	4,306	1	3
J. Milne	4,300	9	6
J. Browell, Blaydon-on-Tyne	4,284	0	0
J. Bewley, Blaydon	4,250	0	0
R. M. Storey, West Boldon R.S.O.	4,244	0	0
E. R. Davison, Blaydon-on-Tyne	4,239	3	10
W. Forster, Pelaw-on-Tyne	4,110	0	0
E. & A. Storey,* Benwell Lane, Newcastle	3,924	0	0

* Accepted. [Rest of Gateshead.]

Ilford.—For the erection of new police-station. Mr. J. Dixon Butler, surveyor, New Scotland Yard, S.W. Quantities by Messrs. Thurgood, Son & Chidgey, Charing Cross Chambers, Duke Street, Adelphi, W.C. :—

Hammond & Miles	£10,440
Lathey Brothers	9,628
Harris & Wardrop	9,559
Lascelles & Co.	9,470
Grover & Son	9,470
Partridge Brothers	9,470
Hammond & Son	9,416
Dowsing & Davis	9,355
F. Willmott	9,170
Fairhead & Son	9,125
Chessum & Son	£9,048
F. G. Minter	8,609

King's Heath (Birmingham).—Accepted for the erection of a public library, for the King's Norton and Northfield Urban District Council. Mr. W. Cross, A.M.I.C.E., engineer, 23, Valentine Road, King's Heath :—

E. Crowder, Farm Street, Birmingham ... £2,795

Pontllanfraith and Tredegar Junction.—For the erection of twenty-nine houses, for the Tredegar Junction No. 3 Building Club. Mr. W. A. Griffiths, architect, Pontllanfraith, Mon. :—

H. Phillips, Ynysddu, Newport, Mon.	£6,273	10	0
Passmore & Perkins, Ynysddu, Newport, Mon.	5,720	0	0
Evans & Waters, Dowlais, Glam.	5,666	0	0
W. & D. Thomas, Bedwas, Mon.	5,350	10	0
H. Rees, Blackwood,* Mon.	5,276	10	0
E. Williams, Newbridge, Mon.	5,249	0	0
E. Hughes, Bargoed	5,113	0	0

* Accepted.

Reigate.—For elementary schools at Frenches Road, to accommodate 510 children, for the Education Committee. Mr. J. Moir Kennard, A.R.I.B.A., architect, 13, Railway Approach, London Bridge, S.E. Quantities by Mr. Charles J. Ford, 4, Mitre Court, Fleet Street, E.C. :—

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Davis & Leaney, Goudhurst, Kent	13,206	0	0
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* Accepted.

(*Continued on p.* xx.)

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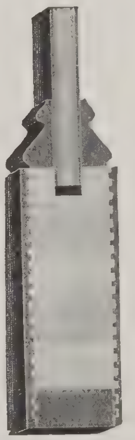

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Hull General Builders, Ltd.	1,009	8	0	107	14	8
H. Kaye, Hull	970	0	0	95	0	0
F. Bilton, Hull	969	19	4	86	3	0
W. Tinkler, New Holland	831	17	6	83	15	0
J. Stamp,* Brigg Road, Barton-on-Humber	822	10	0	82	10	0

* Accepted.

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J. Davison	3,431	15	2
A. J. Cooke	3,422	0	0
Guthrie & Son	3,295	0	0
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W. Dykes, Cullercoats	4,090	0	0
R. W. Storey, West Boldon	4,078	0	0
E. T. George, Newcastle	3,900	0	0
W. Tweedy, Jarrow	3,894	0	0
W. Jackson, Gosforth	3,880	0	0
Glen & Moffatt, Jarrow	3,858	0	0
T. Patterson	3,828	8	7
J. H. Greenwell	3,812	3	0
J. Douglas, Cullercoats	3,674	14	7
G. C. Brewis, Monkseaton	£3,670	15	4
R. H. Nesbit & Son, Monkseaton	3,653	10	0
H. Millar, Monkseaton	3,640	1	0
J. & W. Simpson, North Shields	3,600	0	0
S. Fenwick & Co., Newcastle	3,578	0	0
T. Clements, Monkseaton	3,507	15	10
N. Ritchie	3,462	13	0
W. Gray*	3,417	8	10

[Surveyor's estimate, £3,712 9s.]

* Accepted. [Rest of Whitley Bay.]

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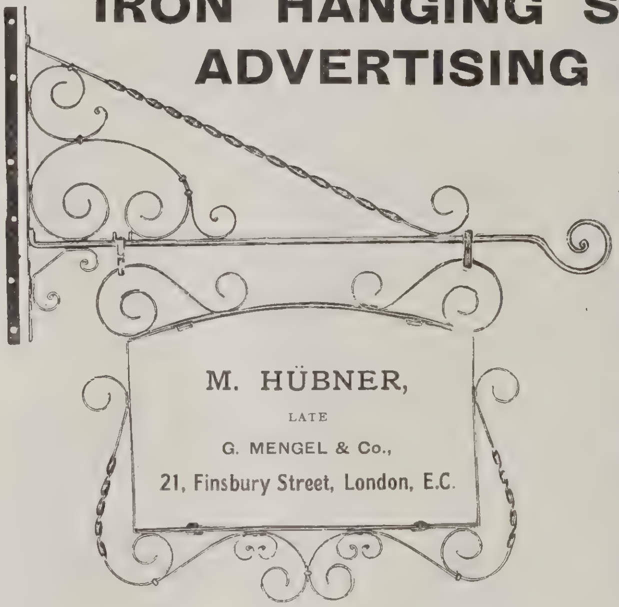

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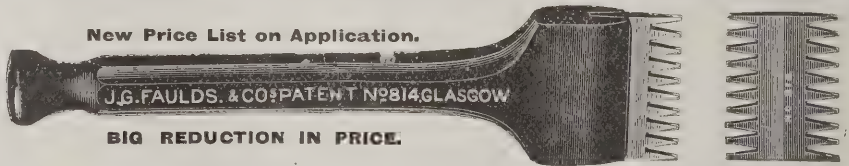
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THE
BUILDERS' JOURNAL
AND ARCHITECTURAL RECORD.

May 24, 1905. Vol. 21, No. 537. 6, Great New Street, Fetter Lane, E.C

Summary.

The attention of the Government is to be called to the fact that there is something like a "ring" of architects for county asylums. (Page 295.)

The length of the old Roman wall found in Jewry Street, London, is to be preserved. (Page 295.)

The master-masons of Glasgow protest against the use of terra-cotta for the walls of the Royal Infirmary extension next the Cathedral. (Page 292.)

The King's College Hospital designs are on exhibition this week at Carpenters' Hall. (Page 292.)

The common formula for the strength of rolled joists is $W = C\frac{ad}{L}$, where W = breaking weight in tons in centre; a = nett area in square inches of one flange + $\frac{1}{6}$ of web (remainder of web assumed to resist shearing only); d = total depth in inches; L = span in feet; C = constant = 7 for rolled iron joists and 10 for rolled steel joists. (Page 294.)

Leeds Associates of the R.I.B.A. indignantly protest against the present large influx of members to the Institute by direct election to the Fellowship, without having qualified by examination. (Page 289.)

At the annual members' dinner held on Thursday last Mr. E. Guy Dawber said they did not want to feel that the Architectural Association was a cramming institution, but a sort of large students' club where they helped forward their fellow-students. (Page 289.)

Papers on the statutory qualification of architects were read by Messrs. Hubbard and Cross before the Society of Architects last Thursday. (Page 285.)

The steel framing of the Ritz Hotel is enclosed by a skin of Portland stone bonded to a brick backing with flat iron bars. (Page 284.)

Speaking at the coming-of-age dinner of the Society of Architects on Friday last the president said the Society was prepared to stand aside in favour of the Institute if that body was prepared either to adopt the present Registration Bill or to substitute another one of a character to satisfy the members of the Society of Architects that the principle which they had so long upheld should be adhered to. (Page 294.)

A huge new soapery is being erected for Messrs. Lever Brothers at Port Sunlight. (Page 295.)

The Buxton sewage works were declared by members of the deputation of eminent French engineers visiting this country on behalf of their Government to be the finest and cleanest they had ever seen. (Page 295.)

The work of preserving the frescoes in the Sistine Chapel at Rome has now been completed. It consisted mostly of strengthening the ceiling and filling up cracks; no cleaning or painting of any kind has been done. (Page 285.)

Rebuilding Regent Street Quadrant. In our issue for April 12th last, on p. 195, we announced that Mr. R. Norman Shaw, R.A., had been appointed by the ground landlords, H.M.'s Office of Woods and Forests, to get out the design for the rebuilding of Regent Street Quadrant, necessitated by the erection of the Piccadilly Hotel, the elevation of which to Piccadilly we published in our issue for February 8th. At yesterday's meeting of the London County Council the Building Act Committee reported that they had considered an application by Mr. Norman Shaw, on behalf of Mr. J. F. F. Horner, a Commissioner of H.M.'s Woods and Forests, for consent to the rebuilding of the Quadrant between Piccadilly Circus and Vigo Street on the south side, and Piccadilly Circus and Glasshouse Street on the north side, with the front portions of the upper floors of the new buildings carried over the entrances to Air Street on both sides of Regent Street. It was stated that the reason for desiring to carry the upper floors of the new buildings over the entrances to Air Street was to preserve unbroken the curved sweep of the upper cornice, and it was pointed out that the entrance to Swallow Street had always been similarly built over. Mr. Norman Shaw had expressed his willingness to make satisfactory provision on the second floor for the ventilation of Air Street, and also for that of Swallow Street, although the latter street did not come within the limits of his application. The Committee were of opinion that the proposed rebuilding would effect a great improvement in the appearance of Regent Street and recommended that the Council should give their consent subject to the following conditions—that satisfactory provision be made by means of an opening at the second-floor level in the buildings over Air Street, on both sides of Regent Street, for the ventilation of Air Street; that the buildings be commenced within twelve months and completed within two years from May 23rd; and that the buildings be otherwise erected and retained without any addition thereto and in exact accordance with the application for the consent, and the plans and particulars which accompanied such application. From this it appears that the completion of the scheme cannot be long delayed. The appointment of Mr. Norman Shaw to design the elevations is satisfactory to the architectural profession and enlightened public opinion, who feared the same vulgarization as has occurred in other parts of Regent Street. Mr. Norman Shaw fortunately occupies the peculiar position of being trusted by the architectural profession, and may be played as a safe card by those in authority when stirred to action by strong opinion. But it is only a make-shift arrangement, and the profession should agitate for this principle to be established as a precedent—that eminent architects be appointed to design or advise on buildings on important sites under the control of public authorities.

A Caustic Letter. The recent death of Lord Grimthorpe (to whose feud with architects we referred at the time of his decease) recalls a letter which must be among the most caustic ever addressed to the Institute. In resigning his position as Honourable Associate, Lord Grimthorpe thus wrote to the secretary of the Institute: "I have for some time observed that your meetings are more and more occupied with discussions about the constitution and supposed professional interests of the R.I.B.A., and less and less with anything tending to advance architecture. According to your own calendar for this year, 50 per cent more meetings are devoted to what are simply trades-union discussions of your own than to reading and discussing architectural subjects; and those that have been read have been more uninteresting than I remember in any former year. One of your meetings yearly is occupied with utterly unprofitable speechmaking on presenting the medal you obtained from the Queen for the advancement of architecture to some architect whose reputation is already made: the most foolish of all applications of prizes, and quite contrary to the object for which they were intended or adopted in all seats of learning, and even in learned societies. In some of them, indeed, they have declined into mere personal compliments or conflicts, but in none have they so little of their original and proper use as in yours. . . . . In short, the primary object of the Institute is becoming, more and more distinctly, to advance not architecture but architects; at least, if they put your letters after their names, which only a very small proportion of them do. You have a right to do so if you choose, as any other trade or professional society has; but the more you do, the more ought other people to stand aloof, and not to help you by pretending to be members of your body and concurring in your objects, while, in fact, we have nothing at all to do with them. The Honourable Associates are a mere sham for every purpose except contributing about £220 a year to your finances and giving some appearance of weight to your proceedings by their names. Therefore, I, at any rate, shall do so no more, but retire from what has always seemed to me a false position, since I was obliged by well-known circumstances to pay some attention to your proceedings . . . ." Comment on this is not needed: the letter stands by itself.

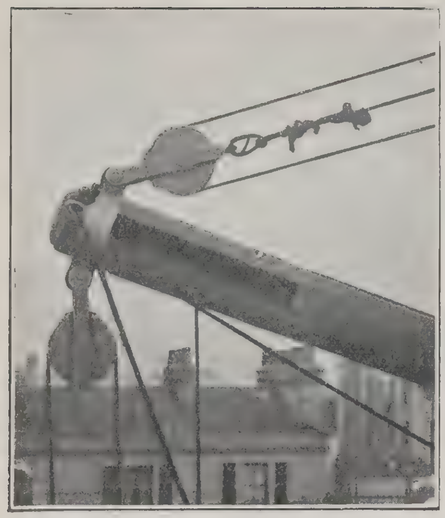


FIG. 1.—HEAD OF CRANE.

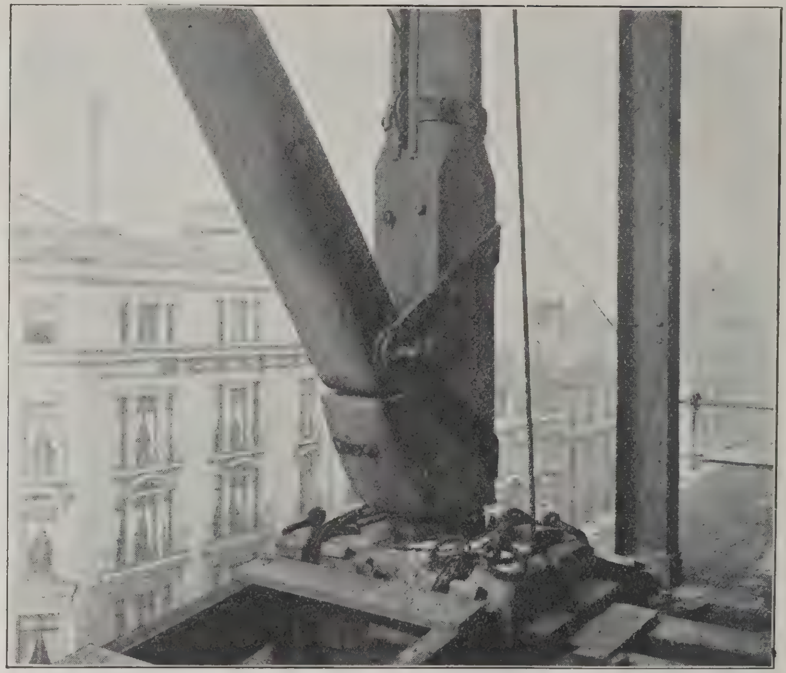


FIG. 2.—BASE OF CRANE.

THE RITZ HOTEL.

IN this issue we give a further series of photographs of the Ritz Hotel, Piccadilly, London, in course of erection. The photograph taken on April 14th (see p. 286) shows the stonework up to the fourth-floor level, with the steelwork practically completed.

Between ground and first floors there is a gantry, laid with track for distributing the stone along the frontage.

The derricks at the front for hoisting stone rest on timber cantilevers supported on the fifth-floor spandrel beams. The cranes consist of boom, mast, one stiff leg and two wire-rope guides. The design of head and base is shown in Figs. 1 and 2.

To the left of the building, on the Arlington Street front, can be seen two small "house derricks" used for setting stone. These are very practical, as they can be so easily moved from place to place.

The scaffolds are cantilevered on wooden planks set on edge, and rise as the erection of the stonework proceeds.

The other general view on p. 286 brings our record of the work up to date. From this it will be seen that the Portland stone is now erected up to the sixth-floor level, showing the good progress made in a month.

Fig. 3 shows the back wall built on plate-girder at the first-floor level. The concrete covering of the girder flange can be seen temporarily held in place by iron strips and wooden sticks. The concrete ceiling construction, executed on the Columbian system, can be seen behind the girder.

On pp. 290 and 291 we publish the steel-framing plan of the second floor (the framing plans for lower, ground and first floors were published in our issue for March 22nd last). This plan shows the method of indicating dimensions of the levels of beams and girders and the distances from centres of columns to the building line or the face of the area walls. The steel beams are indicated by single lines and their sections by stating depth in millimetres and their weight per lineal metre in kilos. If they are compound girders the section of the plates is stated, but lengths are not given. The sections of plate-girders are given on separate schedules. Figures in brackets thus [ ] indicate the distance from the finished floor-level to the bottom of beam. Figures in brackets thus ( ) indicate the "number" of beam for this floor. This number is given on the shop detail drawing and before the finished beam leaves the shop is stencilled in for reference at erection. The number of a beam is made ten times one of the column numbers in the same panel, which arrangement makes it very simple for the erector to find any beam number on the plans.

Between the ground floor and the second floor, columns 60, 62 and 64 are omitted, these columns and exterior back walls being carried on triple-web plate-girders about 37ft. long. In a future issue we shall publish a shop detail drawing of one of these plate-girders, namely, between columns 59 and 61.

The span over the dining-hall is about 30ft. and no girder was allowed to show below the ceiling. Trusses between the first and second floors were therefore designed to carry the first-floor beams and columns 36, 53 and 56 above the second floor On p. 112 of our issue for March 1st we published a photograph of these trusses, and in a future issue we shall reproduce the shop detail drawing of one of them.

Figs. 4 and 5 show the setting of the Portland stone. The bent flat iron bars are built into the brick backing and to the steel in order to secure good bond. Fig. 5 shows this particularly, the brick backing being seen erected on the right-hand side. Other

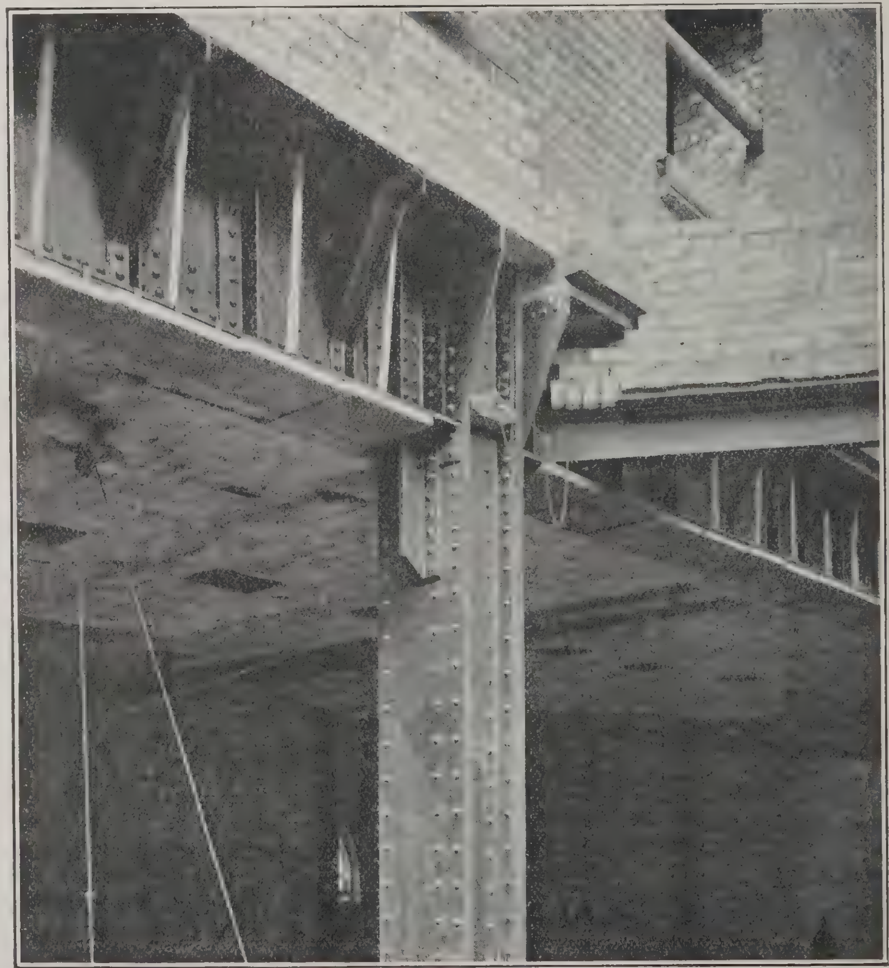


FIG. 3.—PLATE-GIRDER SUPPORTING BACK WALL.

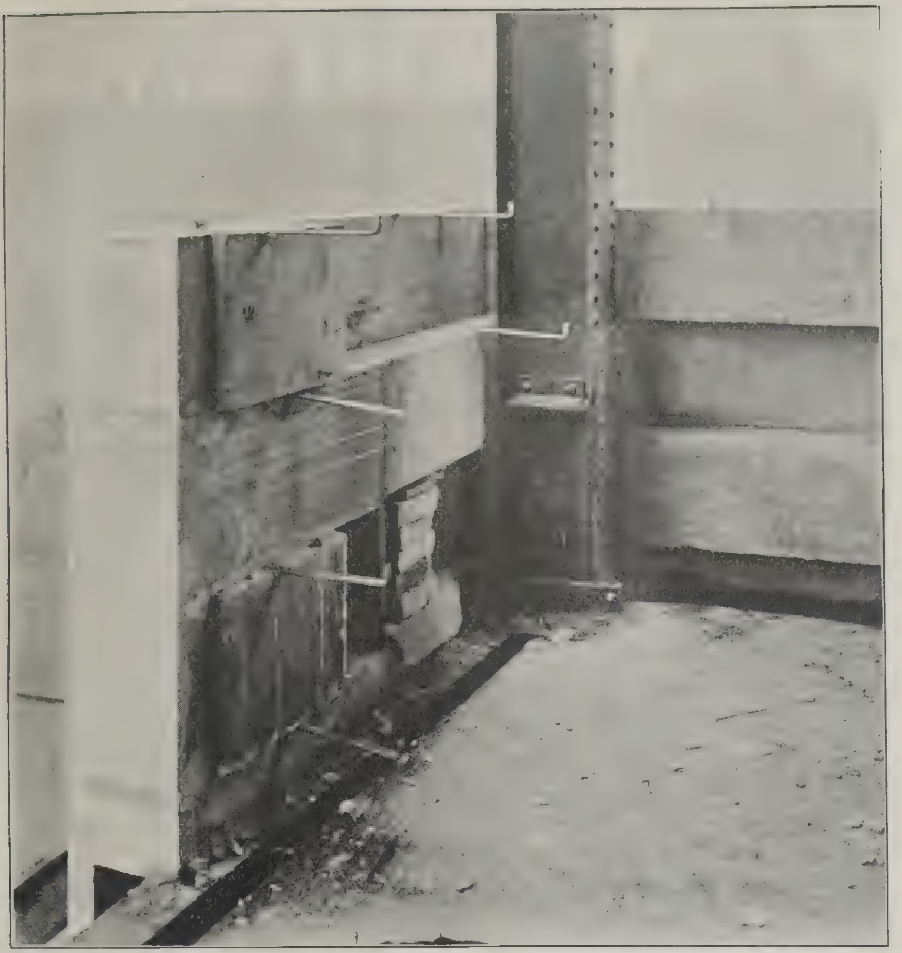


FIG. 4.—PORTLAND STONE FACING AT RITZ HOTEL.

features of this view are the lattice stanchion, the lead down-pipe, and the concrete encasing to the beam.

In our issue of March 1st the photograph on p. 111 showed the granite partly erected. Later we shall give detail views of this work. The granite used is "Standard grey," supplied and erected by Messrs. A. & F. Manuelle, of 57, Gracechurch Street, E.C., and obtained from their Norwegian quarries. The stone is very bright, remarkably uniform in colour throughout, and free from black spots. It will also be noticed on inspection that there is very little mica (and that only in very small grains) in the composition of this granite, and therefore it makes a good weathering stone. The carved heads, of which there are twenty-seven, cut in the keystones of many of the arches, show how readily the stone can be carved; in fact it has been suggested that the stone should be re-named "carving granite." The use of such a hard material as granite for the building from the ground- to first-floor level certainly gives an appearance of solidity and prevents the arrises being damaged so readily as in softer stones.

Recent Restorations in the Sistine Chapel.—The preservation work that has been carried on during the last two years in the Sistine Chapel is now completed, says the Rome correspondent of the "Times." The hold of the plaster on the ceiling needed strengthening. T-shaped metal clamps were driven here and there through the plaster into the roof; and the crevices between the plaster and roof, and the interstices and cracks in the plaster itself, were filled with a mixture of lime and finely-powdered porcelain, so that the frescoes present an even and compact surface. No cleaning or painting of any kind has been done, and no colour has been added. The actual work was carried out by Signor Cecconi Principi, a restorer of great experience, who was assisted by Signor Giovanni Cingolani.

REGISTRATION.

Papers by Mr. Hubbard and Mr. Cross.

AT last Thursday's meeting of the Society of Architects papers on the proposed statutory qualification of architects were read by Mr. G. Hubbard, F.S.A., F.R.I.B.A. and Mr. Alfred W. S. Cross, M.A. Cantab., F.R.I.B.A.

Mr. Hubbard's Paper.

Mr. Hubbard said that as a London practising architect and as a Fellow of the council of the R.I.B.A. he was very anxious to know more of the general feeling of the profession in respect to registration—not merely from idle curiosity, but because he desired to make some practical use of it so that the Bill might receive the unanimous support of the profession throughout the country.

The allied societies of the Institute had made up their minds on this question while the London men had remained apathetic; and it was very much, if not almost entirely, due to the representatives of the allied societies on the council that London was at last rousing itself.

In a broad sense it was easy to see that a Bill for the protection of qualified architects was very desirable; but it was not so easy to see how a Bill could be framed which should be constitutional in its clauses. It was obvious that no Bill would be acceptable to Parliament which was unconstitutional, nor would it be likely to get through its Committee stages if undue opposition were brought to bear against it. Certain judicious compromises might have to be made in matters of minor importance, though in all matters essential there must be unity.

Retrospection.

Guidance for the future could best be gained by studying the past.

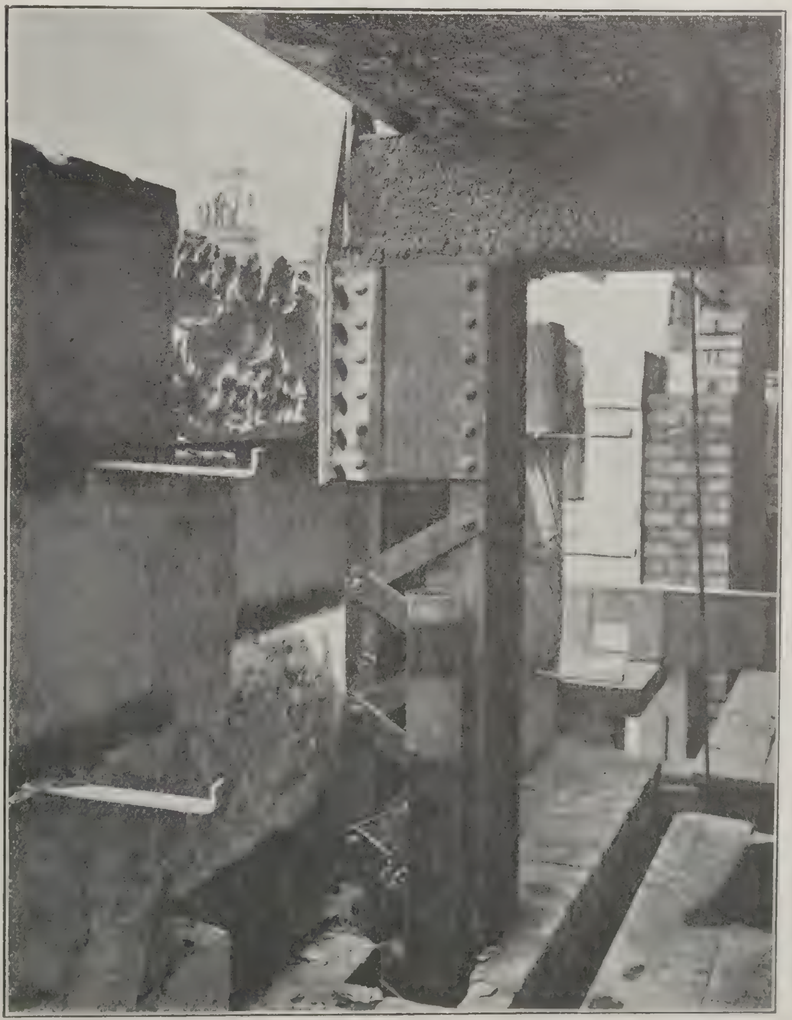
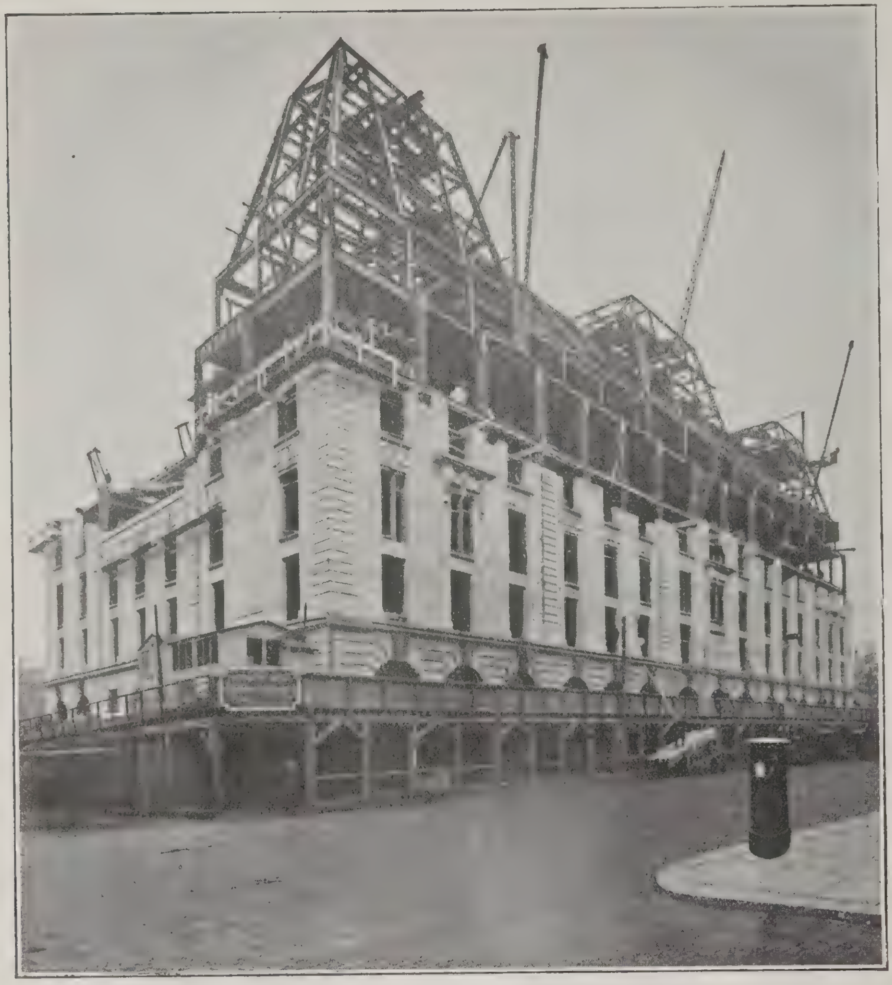


FIG. 5.—BRICK BACKING TO STONE FACING IN COURSE OF ERECTION.



(*Photograph taken on April 14th, 1905.*)

If we looked back a quarter of a century we found that there was no compulsory examination for the Associateship of the R.I.B.A. There was, however, a voluntary examination, though few candidates ever presented themselves.

It was not till the year 1882 that the compulsory examination for Associateship was started, and the immediate result of converting the voluntary to the compulsory examination was that there was an immediate rise in the number of candidates. And ever since that compulsory examination was started in 1882, there could be no question as to the superior class of men who had joined the Institute or of the superior quality of their works.

Compulsory Examination

had encouraged candidates to study the art they intended to practise with a great access of competence to themselves and of dignity to the art of architecture; and what held good for the few might be fairly assumed to apply equally well to the many. A general application of the principle of excluding the incompetent from the profession would result in protecting the competent, and the art of architecture from its most flagrant debasers.

The Two Bills.

For many years the profession had had before it a Bill promoted by the Society of Architects. This Bill, in his opinion, was excellent in its general scheme, but capable of improvement in detail. The Institute was, however, the right body to bring forward such a measure.

No Bill would be acceptable to the profession which did not recognize the R.I.B.A. as being the official head and which did not give each provincial society and the Society of Architects a reasonable representation upon the governing body. Also, no Bill would be acceptable to Parliament which did not give the Privy Council representation, and possibly right of final appeal.

Recognition of all Practising Architects.

It was essential that vested interests of all practising architects would have to be recognized. All who were now gaining their livelihood as practising architects had this vested interest, and it would be unconstitutional to prevent any, even the most incompetent, from continuing thus to earn his living. As the ignorant and incompetent died, however, the vacancies would be gradually filled by the properly trained and qualified; so that in the generation to follow architecture would gradually recover when entrusted only to the qualified to practise.

Medicine and Surgery.

It was just thirty years since internal jealousies delayed the passing of the Medical Act, and it was now just fifty years since that Act was passed, and yet throughout the land it was doubtful if a single medical practitioner was to be found who had not passed the necessary medical qualification.

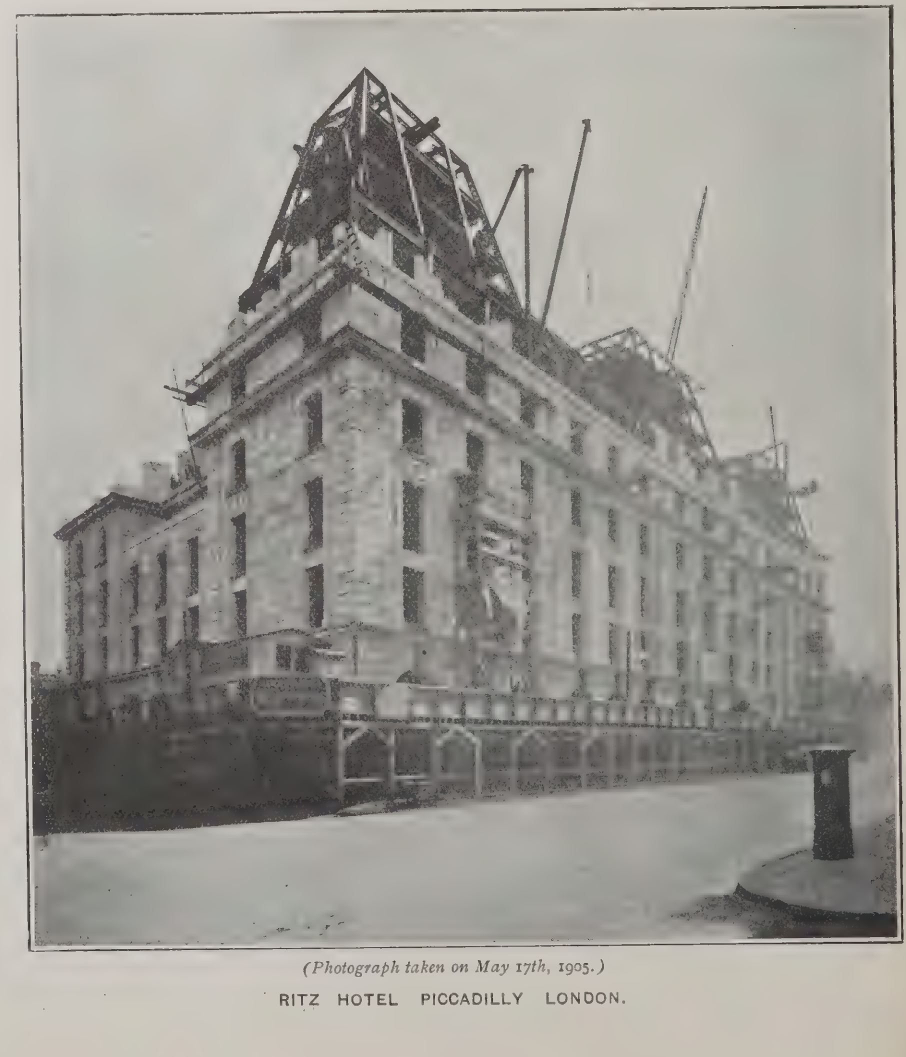
Our grandfathers might tell us how different was the respect accorded to the Barber Surgeons of their day as compared with the respect shown to properly qualified men to-day. Not only had the stamp of man entirely altered, but the immeasurable advance both in medicine and surgery was unquestionable.

It was just twenty years since the first Bill for the Registration of Architects was drafted. "Think for one moment how different would our position be to-day had the Bill been passed. There is now practically unanimity amongst the provincial societies. London is wavering, but even there the active opponents are few and unable to bring forward any valid arguments."

There were two reasons

Why London lagged Behind.

Firstly, just as it was easier to move a cwt. than a ton, so it was easier to convince a small compact community than to convince



(*Photograph taken on May 17th, 1905.*)

RITZ HOTEL PICCADILLY LONDON.

a great and loosely-bound body of men. Secondly, in the provinces the necessity of registration was much more real and apparent than it was in London.

For the ultimate success of the movement it was essential that all future candidates for the profession should serve a certain period of indentures with a registered practitioner or in some recognized architectural college or school, and after that period they would have to pass the qualifying examination, which would have to be conducted under the auspices of the R.I.B.A. None but those who had properly fulfilled these conditions would be entitled to call themselves "architects," nor would they be able to recover their fees as such in a court of law, nor would they be able to issue valid certificates.

The London Architect under the Bill.

In London the individual architect was but one amongst thousands; he had his own particular *clientèle*, and he perhaps spent his life without his existence even becoming known except to a very small section of the great architectural world. His lot would probably not be improved or damaged by statutory qualification, and he did not therefore hold any decided opinion one way or the other.

The Provincial Architect.

In the provinces the architect's position was very different. He was known to all the other practising architects in the town or neighbourhood. The architects, too, were generally well known to the inhabitants, and the status of the architect was more clearly defined.

The standing of the provincial architect, or any architect of education, was distinctly damaged when perhaps an intelligent bricklayer, for instance, who had raised himself to the position of clerk of works, and who, after having served some time in that capacity, suddenly aspired to calling himself an architect. He might not perhaps enjoy a vast amount of confidence or succeed in securing a vast amount of work, but the fact remained that both men called themselves "architects," and as such they became bracketed together in the eyes of the public. By allowing both men to be established on the same footing the professional status of the educated architect was seriously damaged.

That statutory qualification will do much to improve the status of the architect, there could be no doubt.

The Main Points

aimed at in the proposed Bill were as follows:—

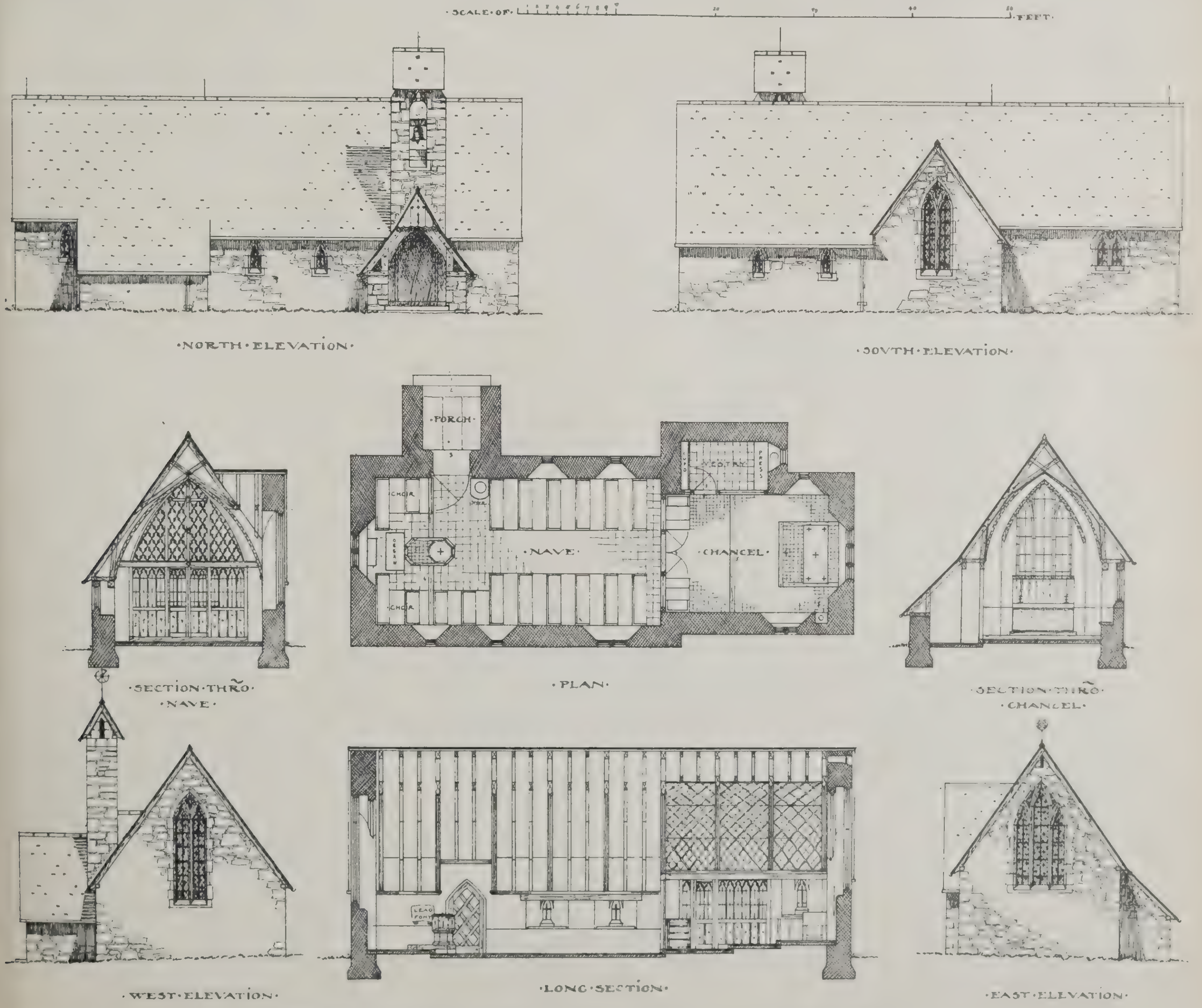
(1) The R.I.B.A. to be recognized head of the profession.
(2) Adequate representation of London and provincial architects on the governing body.
(3) Representatives of the Privy Council on the governing body.
(4) The vested interests of present practising architects to be recognized.
(5) The vested interests of assistants.
(6) A register or roll of architects to be kept.
(7) Compulsory examination for those in the future who wished to practise as architects.
(8) The governing body to have the right of striking any name off the roll or register for malpractice.
(9) The safeguarding of the name "architect" from being used by any except those who were registered.

Mr. Cross's Paper.

Mr. Cross divided his paper under three heads, namely; the present state of architecture and of the profession, the statutory qualification of architects, and the reformed profession.

The present position of architecture was unsatisfactory. Whilst the works of modern architects sometimes displayed a certain amount of creative power or originality, this attribute was very rarely found in combination with architectural scholarship, by which Mr. Cross said he meant an intelligent appreciation of the true principles which formed the foundation of the now popular Italian Renaissance style—principles exemplified in the glorious buildings of ancient Greece and Rome.

Modern architects were rapidly losing the old-time instinct for proportion, harmony, beauty of line and architectural scale, chiefly through their persistent efforts to ruin, by the introduction of grotesque travesties of the Orders, designs which might otherwise pass as fairly successful. Did any sane man contend that the art of architecture was advanced by designing Corinthian or Ionic columns with heights equal to about fifteen times their diameters, or by the happy and decidedly original inspiration of combining,



MISSION CHURCH, NEAR CONWAY NORTH WALES.. H. L. NORTH, ARCHITECT.

say, a Corinthian entablature with a Doric order? Such affectation was merely evidence that many had not mastered the grammar of their profession and that our architectural education was imperfect.

The Past Policy of the Institute.

The favourable reception given to the proposed scheme for registration was due in a large measure to the Institute itself, which had through its successive councils generally favoured a policy little short of one of absolute indifference to the legitimate grievances of its ordinary members, who were now beginning to realize how impossible it was, under existing conditions, to penalize unprincipled or unprofessional conduct, and to recognize the almost insuperable obstacles placed in the way of those desirous of effecting measures of reform in the conduct of architectural competitions. These facts, coupled with the Institute's well-known disinclination to afford assistance to architects who in a private capacity were battling for rights such as those affecting the ownership of drawings—which question, by the way, ought in the general interests of the profession to have been made the cause of a test action or actions fought under the auspices of the Institute itself years and years ago—had had due weight with many architects who would otherwise have withheld their support to the movement in favour of registration.

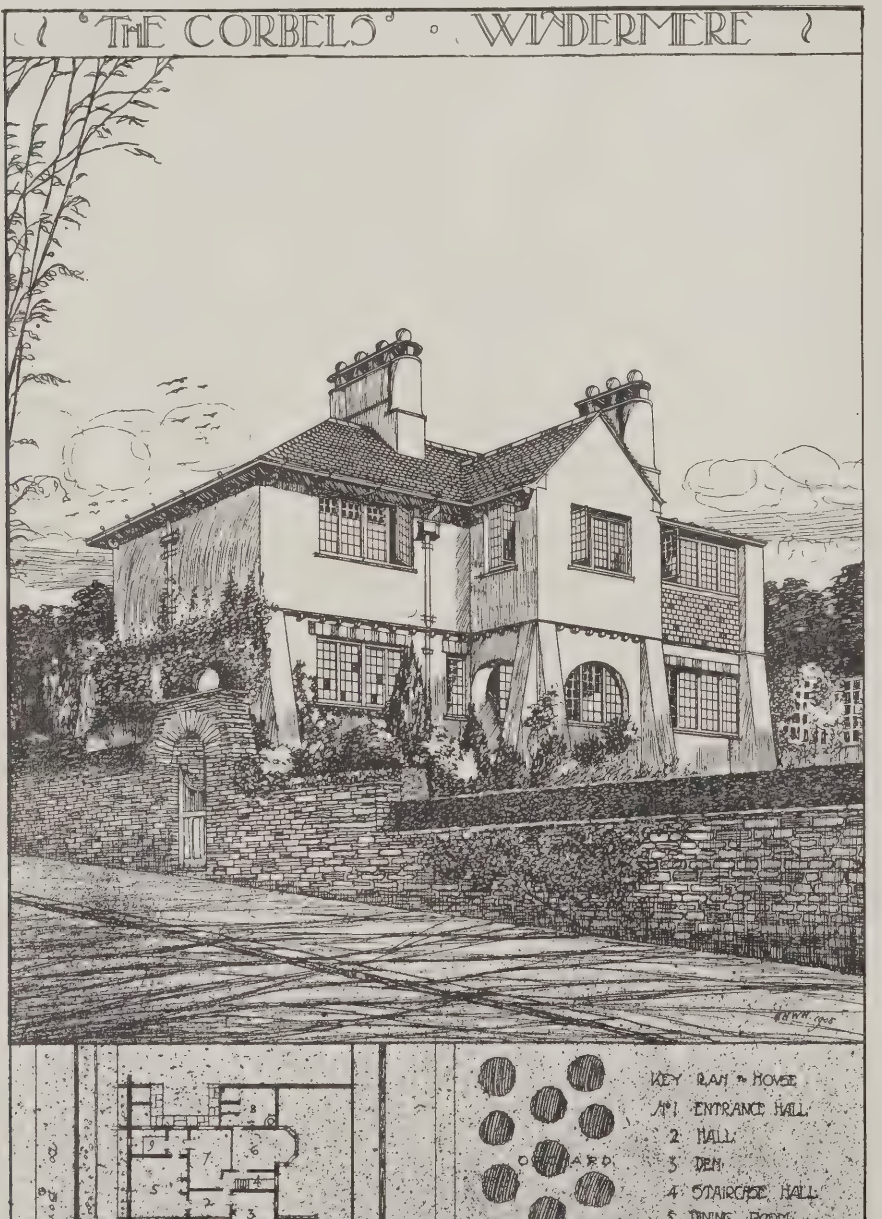
The adoption of a Registration Act

under its auspices would enable the R.I.B.A., if necessary, by a general revision of its by-laws, to severely penalize any member for unprofessional or dishonourable conduct, and to admit of its instituting a thoroughly comprehensive system of architectural training by which men of good general education and culture would be attracted to the profession; and to effect this, steps would probably be taken to enable the R.I.B.A. to enter into negotiations with the governing bodies of all the universities in the United Kingdom with the view of inducing them to appoint professors of architecture at their respective seats of learning.

The Reformed Profession.

And after the Registration Bill had become law, and when through its instrumentality the flow of hordes of illiterate and incompetent men now overwhelming by sheer force of numbers the legitimate practitioners was effectually and finally checked, to what extent would the art of architecture and its exponents benefit?

Well, it would take time, but the final issue of their labours could never be in doubt. Under a wise scheme of registration the average architect of the future should be a man of sound general education and culture and as such he would recognize that he was a member of a great and honourable profession to which he was proud to belong He would know that all unprofessional or dishonest conduct will meet with prompt and exemplary punishment, and owing to his early associations with many of his fellow-practitioners, either at the public school or university, he would be possessed of what was sadly lacking in the profession at present namely, a strong feeling of *esprit de corps* and although his designs might possess little or no great creative power or originality they would be far more likely, on account of their technical scholarship alone, to stand the test of time than those produced by an illiterate and imperfectly trained man o perhaps far greater natural ability.



Discussion.

A vote of thanks was proposed by Mr David Morgan and seconded by Mr. Ellis Marsland. The latter said they had always held the view that the Institute should do this work, but it sometimes happened that reforms in a great body came from outside Registration alone was of course no good It must go with education, and if there was education it was necessary to protect the person educated. Some of the "high art" men, however, declared that education in architecture was not required; hence without a God-given ability one could not be an architect. He, however, regarded architectecture as a science as well as an art, and consequently put education as an essential requirement. As to any diversity of opinion on "registration" or "statutory qualification," it mattered little what they called it nor did it matter whose Bill was adopted so long as the principle of registration was embodied in it. The Society of Architects would be glad to give the Institute its heartiest support.

Mr. G. A. T. Middleton next spoke. He said the papers read that evening recalled those of days gone by, when the reading of such papers meant practical ostracism at the Institute. Now, however, all was changed Registration would not improve the status of the architect, not in the sense of raising him higher in the social scale; nor would it make life easier, because competition among qualified men would be none the less keen but it would improve the training of architects and at least put competition on a fair basis. They might have to wait some time before the scheme was carried at the Institute There had been talk that some of the big men who opposed registration might leave and form a new association of their own: but he predicted that in ten years' time there would be very few men who were not both members of the Institute and ardent supporters of registration.

Mr. Anthony Scott, speaking of the Bill as i would apply in Ireland, referred to the county surveyors there who encroached so much on the architect's province, and pointed out the need for this fact to be taken into account.

Messrs. H. T. Bonner, R. F. Vallance, A H. Salisbury, Adolphus Curry, Cholton James H. H. Richardson and Walter W. Thomas (president) also spoke, and Messrs. Hubbard and Cross replied. Mr. Hubbard mentioned that he had brought before the Institute council the question of directly aiding the allied societies, and a sub-committee had been appointed to work out a scheme. He spoke enthusiastically of what had been done for registration by Mr. Middleton, who had drawn up the first Bill and was a prime mover in the matter.

The following were elected members of the Society of Architects:—J. Bevir (Lymington) E. L. Cotterell (Wolverhampton), S. J Holliday (Birmingham), J. A. Lucas (Exeter) W. H. Robinson (London, W.C.), W. Syme (Kirkcaldy), J. F. Walker (Port Elizabeth S.A.) and G. H. Wenyon (Tipton).

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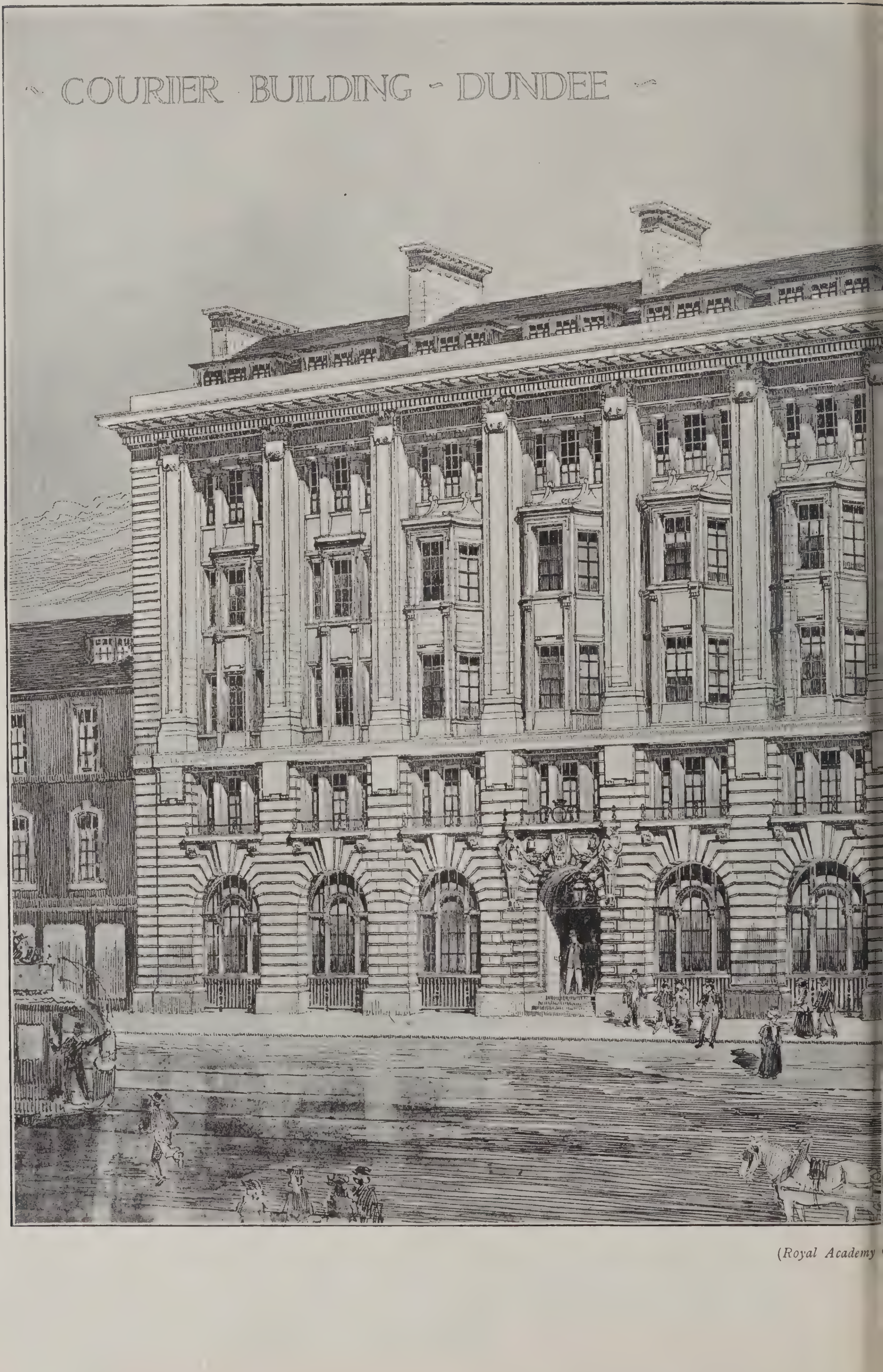
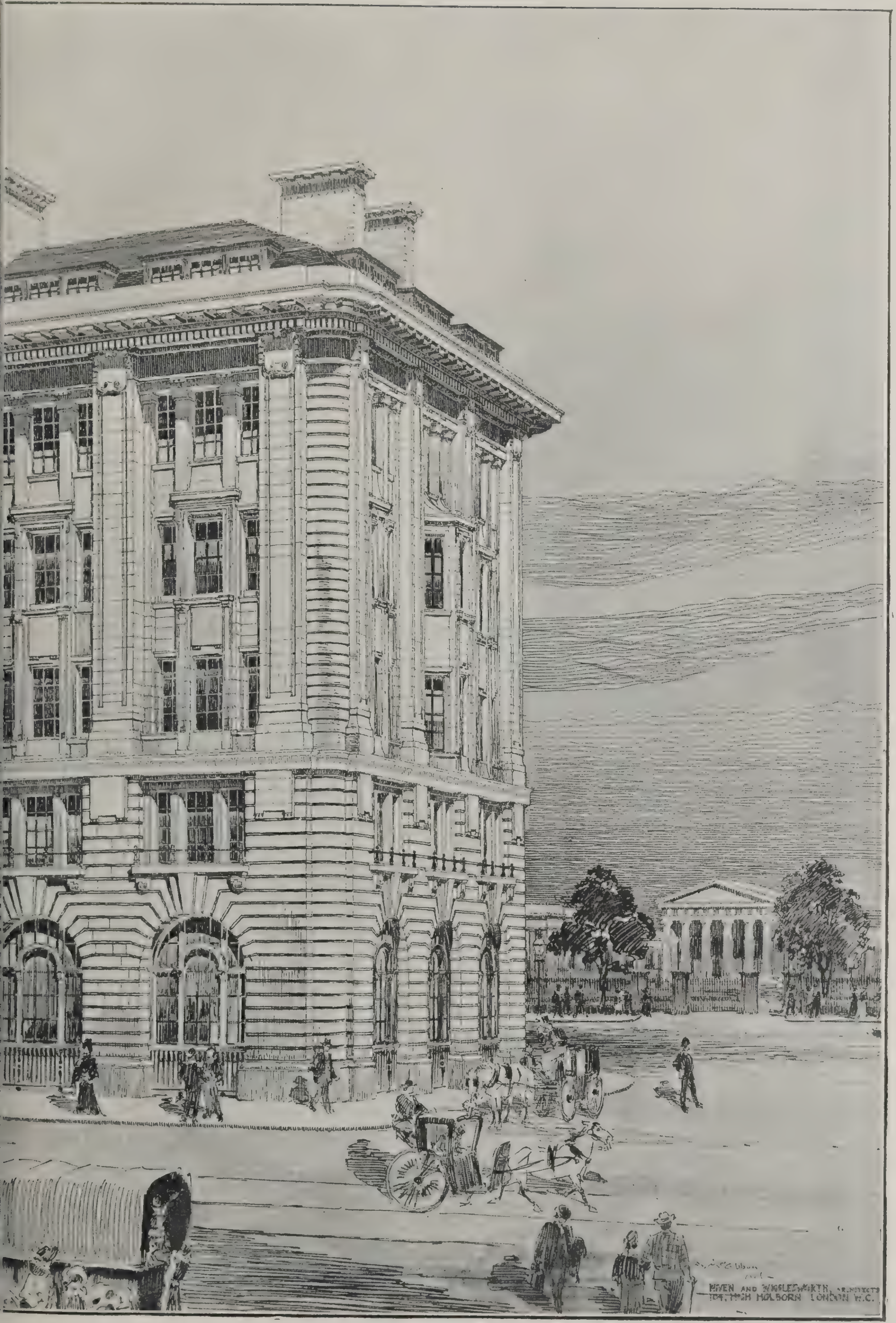
Supplement to
The Builders' Journal and Architectural Record,
Wednesday, May 24th, 1905.



(Royal Academy

NIVEN AND WIGGLESWORTH, ARCHITECTS
104, HIGH HOLBORN LONDON W.C.

on, 1905.)

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A.A. DINNER.

THE annual dinner of the members of the Architectural Association was held last Thursday evening at the Criterion Restaurant, Piccadilly Circus, London, W. Mr. E. Guy Dawber, president, occupied the chair, and among the large number present (about 120) were Mr. J. S. Gibson, vice-president; Mr. Francis Hooper, hon. treasurer; Messrs. Louis Ambler and Henry Tanner, junr., hon secretaries; Mr. W. J. Locke, secretary of the Royal Institute of British Architects; and Messrs. R. S. Balfour, G. B. Bulmer, Walter Cave, J. D. Crace, Henry T. Hare, Arthur Keen, H. P. G. Maule, John Murray, W. A. Pite, A. N. Prentice, Hugh Stannus, Leonard Stokes and A. Needham Wilson.

After the toast of the King, the Queen and the Royal Family had been proposed from the chair, Mr. E. Guy Dawber proposed the toast of the Royal Institute of British Architects, which he referred to as the parent body of the Association. It had always been very kind to the Association, and especially the council. For many years past they had made an annual grant, and had helped with a donation to the building fund. He coupled with the toast the name of Mr. Henry T. Hare, as a vice-president of that body, in the absence of the president. Mr. Hare, in reply, said the Institute was most closely associated with the Association and regarded it with the greatest sympathy, and wished to give it every support in its power. Its members were very largely recruited from the ranks of the Association. He did not wish on such an occasion to touch on politics, but there was considerable commotion among the architectural profession at the present moment, and it was very doubtful if they would be able to maintain their present position, namely, on the fence. Every member of the Association was an educational enthusiast, and whatever qualification might be imposed in the future upon an architect before he were allowed to practise (and this would be directed against the unworthy), he was sure the members of the Association would be able to regard it with equanimity.

The Social Side of the Association.

Mr. Dawber, in proposing the toast of the Association, said that during the last few years they had embarked upon two large undertakings, namely, the new premises and the day school. These had proved wonderfully successful. They had, however, entailed a large monetary outlay. He had that evening received a letter from a very generous donor who offered £1,000, provided the remainder required to wipe off the debt was collected that year. He appealed to the members to clear the small amount of debt remaining. Now that they had established themselves in the new premises, and with a school of architecture which he was sure was going to do a great deal of good work in the future, he felt they should pay attention to the social side of their work, which had been somewhat neglected. They did not want to feel this was a cramming institution and that the day school was the be-all and end-all of their aims. It should be a sort of large students' club, where they helped forward their fellow-students. He suggested that during the next year they should have some social evenings together and mix much more than they did. One evening they might have an "at-home" at which all the sketches done by members during the holidays might be hung up and freely criticized, while another evening might be spent in giving vent to their grievances. They ought to make their premises more attractive as a club. He coupled with the toast the name of Mr. Walter Cave.

Mr. Cave in reply said the reduction in the debt was due to the efforts of Mr. Dawber. Of equal importance with the social side of the Association's work was that of the schools, which had one of the best courses of instruction and were turning out some of the very best men.

Mr. A. O. Collard proposed the toast of the Visitors, which was responded to by Mr. T. L. Forbes.

Mr. Dawber then proposed the health of the secretary of the Association, Mr. D. G. Driver, observing that no one had worked more than he to further the educational scheme. The toast was given with musical honours, and Mr. Driver replied.

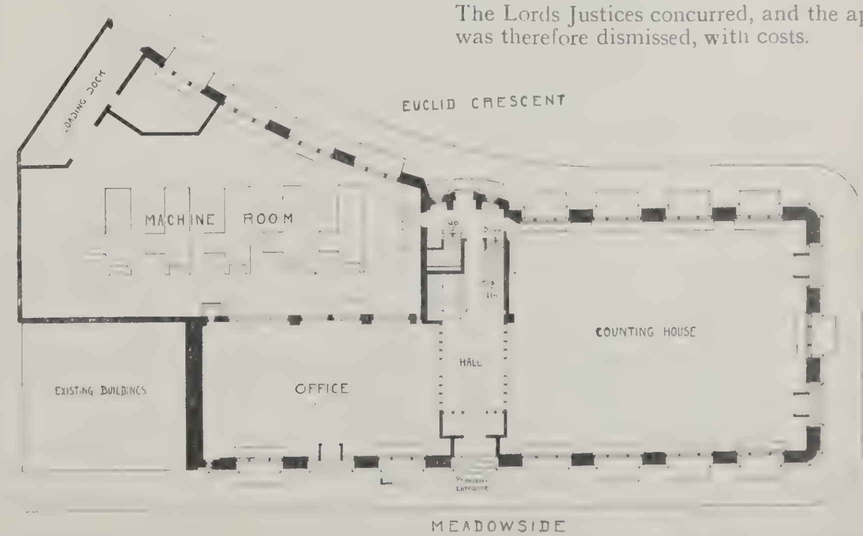
The toasts were interspersed with a very witty and humorous entertainment by Mr. Percy French.

PROTEST AGAINST ELECTIONS TO FELLOWSHIP R.I.B.A.

AT a meeting held on May 15th, at Leeds, the following resolutions were passed by local Associates of the Royal Institute of British Architects:—That this meeting of Associates views with much indignation the present large influx of members to the Royal Institute by direct election to the Fellowship; and in view of the facts (*a*) that many of the candidates are of suitable age to qualify for membership by the special examination provided for such cases, and (*b*) that some of them have not been successful in the examinations but are nevertheless supported by prominent members of the R.I.B.A. council, we protest against this as a lowering of the standard required for membership; as a most unfortunate blow to the cause of professional education they profess to encourage; and as a grave injustice to those who have qualified by examination for membership at much expenditure of both time and money. We urge upon the Associates in London and in all the allied societies to combine in opposing these numerous and unwarranted nominations by demanding a ballot as prescribed in by-law 9, and by all the regular means.

OUR PLATE.

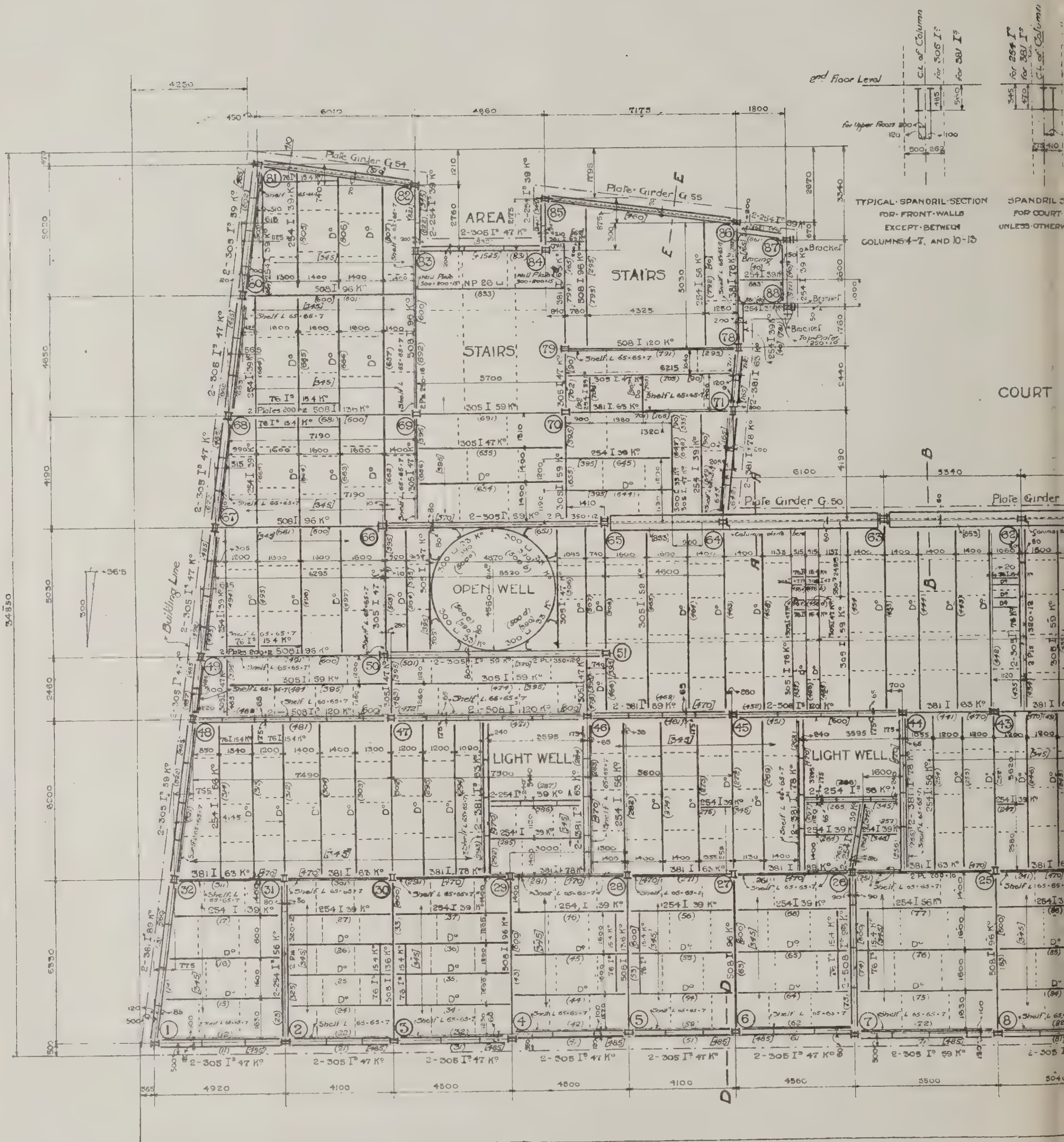
PARTICULARS of the new offices for the "Dundee Courier" were given in our issue for February 22nd last, when a series of photographs showing the reinforced concrete work in the foundations in course of construction was also presented. The drawing in the Academy shows the building complete. The accommodation on the ground floor is indicated by the accompanying plan. The building is of Dumfriesshire red stone, and will be fire-resisting throughout. Messrs. Niven & Wigglesworth, of London, are the architects, and Mr. T. C. Stocks, of Dundee, is the general contractor. The clerk of works is Mr. T. Robertson. Messrs. Richard Moreland & Sons are the contractors for the steel construction.



GROUND-FLOOR PLAN, "COURIER" BUILDING, DUNDEE NIVEN AND WIGGLESWORTH, ARCHITECTS.

Law Cases.

Two Workmen's Compensation Appeals.—Two interesting cases under the Workmen's Compensation Act, 1897, have recently been decided by the Court of Appeal. In the one—that of *Nicholls* v. *Bishop*—a bricklayer claimed compensation from a Birmingham builder for an injury—a crushed finger—sustained whilst the applicant was helping a foreman to move a girder. The judge held that the accident did not arise out of the bricklayer's employment, and the Court of Appeal took the same view, dismissing the case. A report of the case when it came before the Birmingham County Court will be found on p. 59 of our issue for February 1st last.—The second case was that of *Buckingham* v. *Fulham Borough Council.* The latter are the owners and occupiers of a piece of ground known as "Munster Yard," which is bordered on one side by the railway and on another by stables. There was a blacksmith's shop in one corner, and the yard was used as a "dumping" ground, where scrap-iron, old wood-paving blocks and other disused materials were collected and stored. The applicant was employed in shifting a quantity of scrap iron from one part of the yard to another, and in doing so his hand was cut by a rusty bit of iron, and he contracted blood poisoning. It was attempted before the arbitrator to make the respondents liable on the ground that the place where the man was employed was a "warehouse" or "factory" within the meaning of the Act. The deputy county-court judge refused to accept that view, expressing an opinion that a "storehouse" or "warehouse" must be covered in to some extent, at any rate, and that the mere fact that cement and other materials which were affected by rain were placed under railway arches did not alter the character of a yard. He therefore decided in favour of the respondents. For the workman it was now contended that the learned deputy judge had misdirected himself, and that he ought to have held that this dumping ground was a warehouse, or, alternatively, that it was a factory because of the blacksmith's shed which stood in one corner. At the conclusion of the arguments, the Master of the Rolls said that the place where the accident happened was in the ordinary sense of the word a yard, and the opinion he had come to was that the workman's contention that it was a warehouse could not be accepted. The Lords Justices concurred, and the appeal was therefore dismissed, with costs.



NOTE: Figures·in·brackets·thus [ ]·denote·the·distance from·finished·floor·line·to·bottom·flange·of·beams

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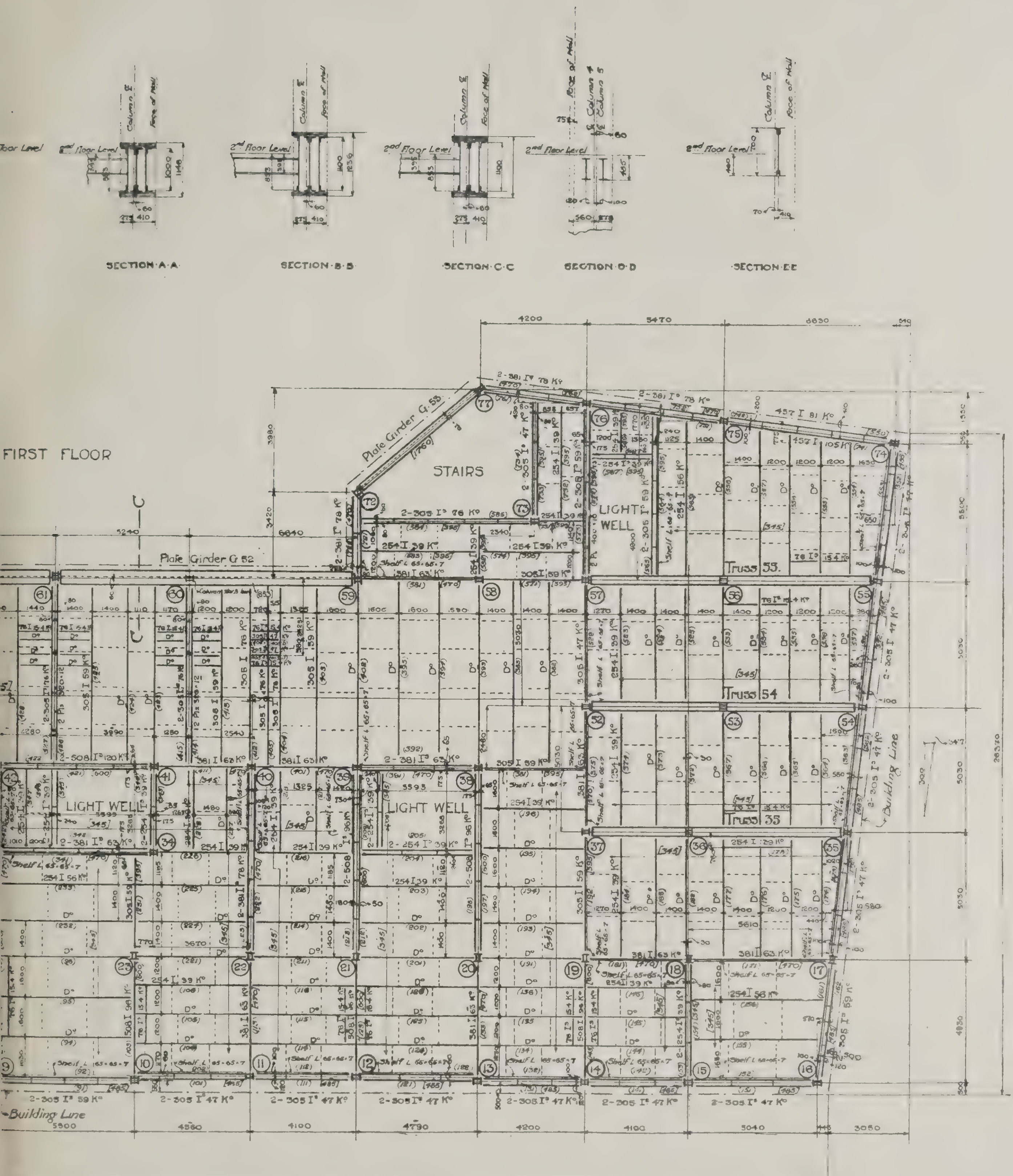
For·framing·round·flues·see·drawing·N° 27.



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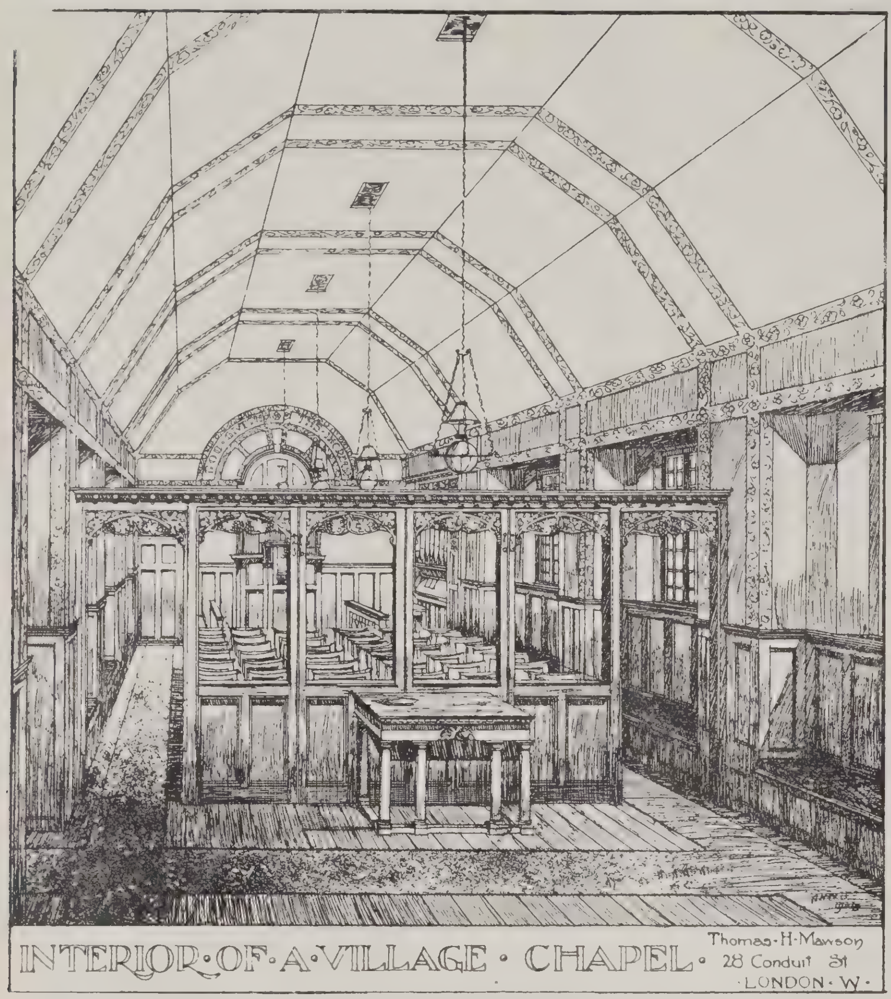


(*Royal Academy Exhibition*, 1905.)

Builders' Notes.

The Birmingham Building Trades' Federation is to be dissolved and the balance in hand of £990 distributed.

A Strike at Dunfermline is threatened. The masters insist on a reduction of wages from 9½d. and 9d. The men oppose the reduction.

Employment in the Building Trades continued dull during April, but was, on the whole, slightly better than a month ago. It was worse than a year ago.

Messrs. Sheen & Wells (late Stanley Sheen & Co.), heating and ventilating engineers, of Sheffield, in order to meet the demands of an increasing business, have found it necessary to remove to larger premises. They have therefore purchased the Bath Street Iron Works, Sheffield, which in future will be their address.

Year's Building in Edinburgh. — The annual report on work done in connection with the burgh engineer and master of works' department of Edinburgh states that, nothwithstanding the outcry about the dulness of trade and want of employment, the value of work during the year was £994,940, compared with £825,584 in 1903 Speculative building seems to have suffered no check, the estimated value for that class of work having been £568,900.

Glasgow Masons and the Royal Infirmary. —A special meeting of the Master-Masons' Association of Glasgow and neighbourhood was held last week to protest against the proposal to construct the outer walls of the addition to the Royal Infirmary in terracotta, having regard to the fact that the adjoining building is the ancient cathedral. It was remitted to a committee to exercise whatever powers it possessed to get the frontage of the building constructed of stone.

Competitions.

Children's School, Richmond, Surrey.—1st, Mr. E. J. Milner Allen; 2nd, Mr. C. Harrison Townsend—both of London. The school is to accommodate 500 children, with extension to 1,000.

Wilmslow Cemetery. — First premium (£25), Mr. W. Longworth, Manchester; 2nd (£15), Mr. H. C. Cullock, Manchester; 3rd (£10), Mr. C. T. Taylor, Oldham. (The last has been accepted by the urban district council.) Mr. H. Beswick, county architect for Cheshire, was the assessor.

Buxton Boys' School.—The design of Mr. Charles Swain, of Manchester and Buxton, has been placed first in this competition and is recommended for adoption. The second place was awarded to Messrs. Garlick & Flint, and the third to Mr. W. R. Bryden, F.R.I.B.A.—all of Buxton. Mr. G. H. Widdowes, A.R.I.B.A., was the assessor.

Public Baths, South Shields.—The design of Mr. J. H. Morton, F.R.I.B.A., for new baths and washhouses at South Shields, to replace the present buildings in Derby Street, has been selected out of ten sets submitted. The estimated cost of the building is £12,000. It will comprise a swimming bath 90ft. long by 30ft. wide, 12 slipper baths, 12 douce baths, 4 baths for women and a public washhouse for 50 washers.

Extension of Shirehouse, Norwich.—The Competition Reform Society disapproves of the conditions in this competition because the information to competitors is insufficient (*i.e.*, no block plan or plans of existing buildings will be supplied) and because a contractor's estimate of the cost of the work is required. Architects are requested to abstain from competing unless the conditions are satisfactorily revised.

Secondary School, Preston.—The Preston Education Committee propose to erect a new secondary school for girls and will shortly invite plans in competition. Mr. F. W. Catterall will be the professional assessor.

The King's College Hospital Designs will be on view in the court room of the Carpenters' Hall, London Wall, on May 26th from 12 noon until 5 p.m.; and on the five following days from 10 a.m. until 5 p.m, except on June 1st, when the exhibition will close at 4 p.m. Admission on presentation of visiting card.

Correspondence.

Fibre Stress in Beams.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Although the calculations in my article on p. 218 of your issue for April 26th were checked, I regret to find that the omission of a little squaring figure has vitiated the result. The calculations should read as follows (at fourteen lines from the bottom of the middle column):—To find this position of neutral axis $\frac{1}{2}\ (x\,b\,d) \times 840 \times \frac{2}{3}\ (x\,d) = \frac{1}{2}\ (y\,b\,d) \times 140 \times \frac{2}{3}\ (y\,d)$, or $280\ x^2\,b\,d^2 = 46\frac{2}{3}\ y^2\,b\,d^2$, or $6\,x^2 = y^2$, whence $x = \frac{y}{\sqrt{6}}$. Now x and y being fractions of d, $x\,d + y\,d = d$, or $x + y = 1$, or $y = 1 - x$, therefore $x = \frac{1-x}{\sqrt{6}}$, or $\sqrt{6}\,x + x = 1$, or $2{\cdot}45\,x + x = 1$, whence $x = \frac{1}{3{\cdot}45} = {\cdot}29$, and $y = \frac{2{\cdot}45}{3{\cdot}45} = {\cdot}71$. Then the total resistance $= \frac{1}{2}\,({\cdot}29\,b\,d) \times 840 \times \frac{2}{3}\,({\cdot}29\,d) + \frac{1}{2}\,({\cdot}71\,b\,d) \times 140 \times \frac{2}{3}\,({\cdot}71\,d) = 47\,b\,d^2$. Returning to the fundamental equation, $\frac{wl}{4} = f\,\frac{b\,d^2}{6}$, then $f\,\frac{b\,d^2}{6}$ must equal $47\,b\,d^2$, or $\frac{f}{6} = 47$, whence $f = 282$. But c having been shown to be $= \frac{f}{18}$, therefore $c = \frac{282}{18} = 15\frac{2}{3}$, to be substituted for $13\frac{1}{2}$ in the article in question, and $\frac{x}{y} = \frac{\sqrt{t}}{\sqrt{c}}$, where t and c are the tensile and compressive resistances respectively.

This does not in any way alter the main conclusions, and only slightly affects the magnitude of the differences pointed out. It is interesting in this connection to note that Warr's "Dynamics," p. 261, states: "Barlow found that in a rectangular fir beam the neutral axis was about five-eighths of the depth, as shown by the section of fracture' this is quite accordant with Du Hamel's experiment. Mr. Hodgkinson, experimenting on cast-iron beams, found the neutral line in sudden fractures from one-fifth to one-sixth of the depth; cast-iron, however, might anteriorly be supposed to present a high neutral axis, since its compressive strength is so great."

The argument for the shifting of the neutral axis before rupture takes place may be put shortly as follows:—The ordinary formula for the strength of a beam is, bending moment M = moment of resistance R, that is, for a rectangular beam loaded in the centre $\frac{WL}{4} = Z\,C$, Z being the modulus of section $= \frac{b\,d^2}{6}$. Take the case of a cast-iron beam 12ins. long, 1in. broad and 1in. deep, with a breaking weight of 1 ton in the centre. Then $\frac{1 \times 12}{4} = \frac{1 \times 1^2}{6} \times C$, or C = 18 tons per sq. in. for extreme fibre stress, whereas with the neutral axis in the centre the stresses on the extreme fibres must be equal on both sides of the neutral axis, and we know that the tensile stress cannot exceed 7 tons per sq. in.—Yours truly, HENRY ADAMS

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Norfolk Churches.

EDINBURGH.—STUDENT writes: "Please name a book giving a complete list and description of the principal churches in Norfolk."

There is no book which gives a complete list, but "Antiquities of Norfolk," by John Sell Cotman, and "Murray's Guide" should answer your purpose. L. G. R.

Worm Holes in Oak Dado.

WOODBRIDGE.—PERPLEXED writes: "About twelve months ago I made and fixed some Austrian oak dado, and in a part there has developed a patch of about 6ins. square of worm holes. Which is the best way to stop this trouble?"

You do not state whether the worms have appeared in the framing or the panelling. The remedy, however, in either case is simple. Knock out the stuff and replace the part attacked with entirely fresh oak. It is not at all likely, then, that the mischief will spread. HARRY HEMS.

Size of Principal Rafter in Steel Truss.

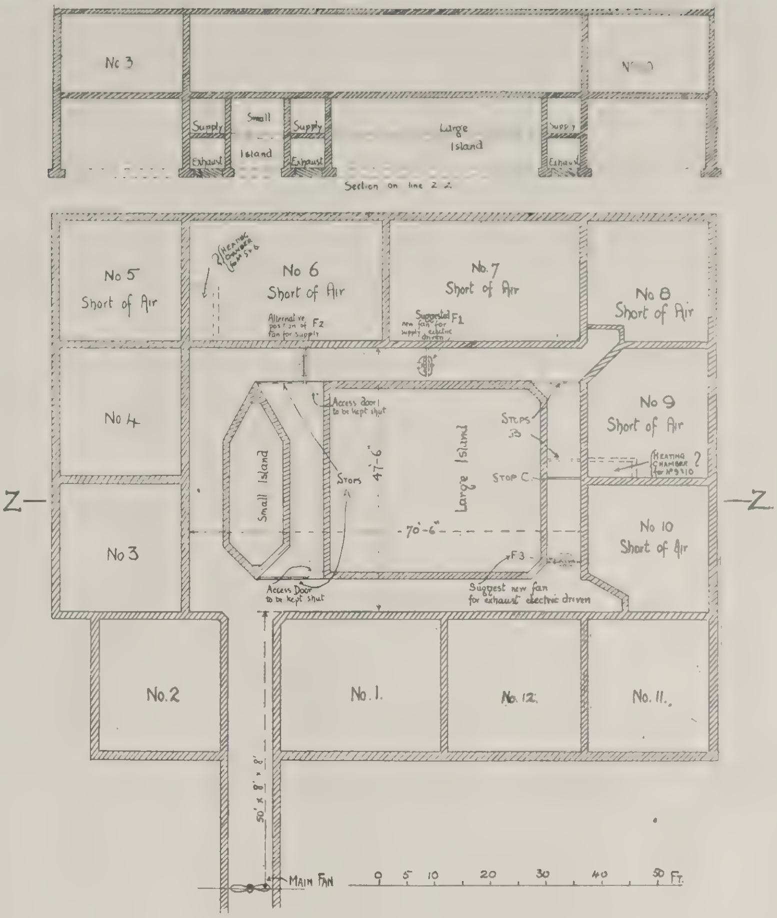
WESTON-SUPER-MARE.—QUID writes: "The accompanying sketch (not reproduced) shows a steel roof-truss of 45ft. effective span. The stress on the part of the principal between A and B is 230 cwts. compression. Which is the best formula to use so as to obtain the size of the section (T-iron) required to resist that stress? I am unable to find out anything definite on this point from any text-books."

This particular truss for the same span will be found worked out completely in "The Practical Designing of Structural Ironwork" (Spon, 8s. 6d.). It is there shown that the principal rafter should be a T-iron $4\frac{1}{2} \times 4\frac{1}{2} \times \frac{5}{8}$, having an area of, say, 5·27 sq. ins. To find the equivalent area in steel, multiply by $\frac{10}{13}$; therefore, $5{\cdot}27 \times \frac{10}{13} = 4{\cdot}06$ sq. ins., or, say, a $4\frac{1}{2} \times 4 \times \frac{1}{2}$ steel T. If calculated by Gordon's formula, the principal rafter is taken as fixed at one end and pivoted at the other. HENRY ADAMS.

Rural By-laws.

A.R.I.B.A. writes: "I am building some houses in a country district, and am having a dispute with the urban council over an unimportant by-law relating to the bearing of some joists. I have put these in contrary to the by-law, though the construction is very much better and the strength greater than if put in according to the by-law: and this the surveyor himself admits, but insists on the letter rather than the spirit of the by-law being enforced. I believe legally they could insist on them being altered, and rather than go to law I should do so. The worst of the matter, however, is that two of the councillors are notorious jerry-builders and are now building and have built within the last few months a number of houses which are glaring infringements of several of the most important by-laws in the book, and this is winked at by the council. I resent this unfair treatment, and therefore objected to making what any competent person would see was an absurd alteration whilst these men did just as they wished. Have I any remedy, and have the Local Government Board any authority in such a case? It appears to be one of those cases, far too common, where some radical alteration in the present law is required."

I think it purely a question of expediency whether you alter your joists to conform to the local by-laws or whether you leave the authority to take proceedings against you if they wish to do so. You have no legal remedy, and the fact that the by-laws are not administered impartially does not affect your case, though of course it might be a telling argument did the case come for trial. As a rule, however, I fear the person who makes the public *exposé* has to pay heavily for the privilege. F S. I.



VENTILATION OF SCHOOL.

Ventilation of School.

X. writes: "The accompanying sketch (re-drawn) shows a system of plenum ventilation carried out at a school. As the classrooms 5, 6, 7, 8, 9, 10 do not get sufficient air to meet the requirements and the extraction is often nil, can you offer any solution of this difficulty? The rooms average 24ft. by 22ft. by 14ft. high. The extraction is at floor-level and the fresh-air inlet is 8ft. 6ins. high. The velocity is not to exceed 5ft. per second, and the quantity to be supplied is 2,000ft. per hour per child. The gas engine is working at 212 revolutions per minute. Is it probable that the fan is sucking some of the air back again? The fan is of 7ft. diameter. The extraction shaft is 76ft. above ground-line, with cast-iron flue-pipe from steam-boiler erected inside it."

The total hourly volume of air needed is 1,200,000 cub. ft.; and the first thing I recommend is that the main fan be tested for its output, and if on its discharge side it is not moving air at this rate it should be replaced by a fan that will. The next thing I recommend is that the passage between the two islands be boarded across at each end, as shown and marked A. This should cause rooms 5 and 6 to work, I think, especially if their heating chamber be as marked, and it may cause rooms 9 and 10 to start also, especially if the stops B are fitted in the far passage. The distance from the main fan of rooms 7, 8 and 9 will, I fear, make a second fan necessary. It should be able to move at least $1\frac{1}{2}$ times as much air as the classrooms need, to overcome the pipe and duct friction, and should be placed about where shown at F, 1; but if the heating chamber for room 6 be there it may be placed where dotted at F, 2. In any case a stop C will be needed at the chamber for No. 10. You do not say where the exhaust shaft is placed, or how the air enters it. The heat from the chimney is not very much for the volume of air that has to be moved, and it is better to make the shaft and chimney independent. If the exhaust shaft is at the opposite end to the supply fan, its pull should make up for the decreased fan-pressure; if it does not, the air entrances must be wrong. If the shaft be near the fan, then another small fan may be needed, as well as that just mentioned for supply; and it should be put in the exhaust duct at F, 3, as shown by dotted lines, and the exhaust passage between the islands must be boarded off like the supply passage. This fan should be able to move all the air from the six defective rooms. Some of the positions I have marked may be unsuitable, owing to flues and heating chambers being near; but you will grasp the main object of the suggestions, which is to get more pressure of air and speed of both currents at the far rooms. If you have to get a new main fan, it may be that the small fan in the exhaust duct will be the only other one needed. O. WHEELER.

Fireclay Partition Slabs.

GLASGOW.—A. B. C. writes: "Is there on the market a wall lining in the form of fireclay slabs of ⊔ shape? The slabs are used for the inside face of external walls, and have the plaster attached to them direct. The slab gives an air-space of about 1in."

We do not know of this exact shape being obtainable out of stock, but the firms who make fireproof terra-cotta partition blocks, such as the Hempstead Patent Brick Co., of

Hemel Hempstead, would be ready to make them to order. Blocks somewhat of the shape desired have recently been placed on the English market by the American National Fireproofing Co., whose European managers are Messrs. James F. Cummings & Co., of 27, Chancery Lane, London, W.C.

Thickness of Walls under L.B.A.

LONDON.—LLAWGNID writes: "In proposed alterations and additions to a warehouse and office block three storeys high, with a basement, some of the external walls around areas are carried on steel girders at the second-floor level, with one end resting on a stanchion and the other end bearing on a brick pier on a party-wall. The district surveyor has intimated that in order to calculate the thickness of these walls it is necessary to assume that they extend unbroken from the ground-floor upwards, or from the basement floor upwards, as the case may be, and not from the top flange of the girders, as the description in the London Building Act would lead one to imagine. Is he correct? Does he not, by assuming that the walls extend from the ground upwards, infringe the by-law regulating the proportion of openings in external walls above the ground-floor storey? In this case, if his contention is correct that the wall technically exists from the ground upwards, the relation of void to solid would be 3 to 1."

I think the answer to this question is found in section 5 of the London Building Act, 1894, which reads: "The expression 'foundation' applied to a wall having footings means the solid ground or artificially-formed support on which the footings of the wall rest, *but in the case of a wall carried by the bressumer means such bressumer*." The next definition also runs: "The expression 'base' applied to a wall means the underside of the course immediately above the footings, if any, or, in the case of a wall carried by a bressumer, *above such bressumer*." Reading these definitions into the sections stating the proper thicknesses for walls of certain heights, one is, I believe, justified in thinking the surveyor has wrongly interpreted the Act. F. S. I.

Strength of Rolled Joists.

BATLEY.—W. R. S. writes: "Please give the formula and method of working out the following problem:—What is the safe load that may be put on a rolled steel joist of 20ft. span, 8ins. by 5ins., and weighing 25 lbs. to the foot run, the weight being placed in the middle? The books I have do not seem to give any formula with a direct bearing on the question."

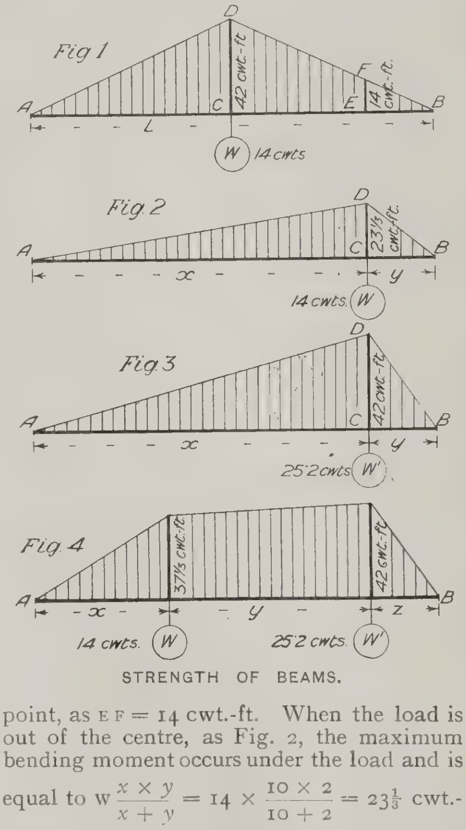
Rolled-joist problems are difficult in an examination because essential facts are generally omitted. In practice what is wanted can be found from a reliable catalogue with the minimum calculation and risk of error. The common formula for the strength of rolled joists is $W = C\frac{ad}{L}$, where W = breaking weight in tons in centre; a = nett area in square inches of one flange + $\frac{1}{6}$ of web (remainder of web assumed to resist shearing only); d = total depth in inches, but for accuracy the mean depth should be taken; L = span in feet; C = constant = 7 for rolled iron joists, 6 for compound girders of ditto with equal flanges, 10 for rolled steel joists, 9 for compound girders of ditto with equal flanges. The area in square inches of one flange of an ordinary joist averages about $\frac{1}{12}$ of the weight in lbs. per foot run, or, including $\frac{1}{6}$ of web, say $\frac{1}{10}$ of weight. Therefore, for a rolled steel joist 8 × 5 × 25 lbs., 20ft. span, we have $W = 10 \times \frac{2{\cdot}5 \times 8}{20} = 10$ tons breaking weight in centre. A span of 20ft. is too great for a free joist 8ins. deep, as the depth in inches should not be less than half the span in feet, or 10ins. in this case. When the joist is less in depth, a higher factor of safety should be used, namely, $\frac{\text{span}}{\text{depth}} \times 0{\cdot}287 = \frac{20 \times 12}{8} \times {\cdot}287 = 8{\cdot}61$, then $\frac{10}{8{\cdot}61} = 1{\cdot}161$ tons or 23·2 cwts. safe load in centre. For comparison of different formulæ for rolled joists and other useful information see "Designing Ironwork," 2nd Series, Part IV. (Spon, 2s.). HENRY ADAMS.

Strength of Beams.

EPSOM.—H. J. W. writes: "The safe central load for a beam 3ins. by 8ins., span 12ft., is 14 cwts. How can I ascertain the safe load if placed 4ft. from centre? Also, how would the safe load be ascertained if the beam were loaded at two different points?"

When the load is central, as on beam AB (Fig. 1), the maximum bending moment is $\frac{WL}{4} = \frac{14 \times 12}{4} = 42$ cwt.-ft., as CD, and the bending moment at any other point is the ordinate to the triangle taken at the required point, as EF = 14 cwt.-ft. When the load is out of the centre, as Fig. 2, the maximum bending moment occurs under the load and is equal to $W\frac{x \times y}{x + y} = 14 \times \frac{10 \times 2}{10 + 2} = 23\tfrac{1}{3}$ cwt.-ft., as shown at CD, where W is the same load as before; but when a new load W' is required to produce the same maximum bending moment, then $\frac{WL}{4} = W'\frac{x \times y}{x + y}$, or $W' = \frac{WL}{4} \times \frac{x + y}{x \times y}$, whence $W' = \frac{WL^2}{4xy} = \frac{14 \times 12^2}{4 \times 10 \times 2} = 25{\cdot}2$ cwts., as shown at CD (Fig. 3). If two loads W and W' are carried as in Fig. 4, the bending moment under W will be $W\frac{x(y + z)}{x + y + z} = 14 \times \frac{4(6 + 2)}{4 + 6 + 2} = 37\tfrac{1}{3}$ cwt.-ft., and the bending moment under W' will be $W'\frac{z(x + y)}{x + y + z} = 25{\cdot}2 \times \frac{2(4 + 6)}{4 + 6 + 2} = 42$ cwt.-ft.

HENRY ADAMS.



STRENGTH OF BEAMS.

Gothic Work to measure in the Peak District and at East Grinstead.

CLAPHAM PARK.—ENQUIRER writes: "Please give particulars of good Gothic work to measure in the Peak district of Derbyshire, making Chapel-en-le-Frith a centre for cycling from; also Gothic work in the neighbourhood of East Grinstead, Sussex."

Churches at Baslow, Castleton, Hathersage, Hope and Tideswell in the Peak district; and Bletchingley, Bolney, Chailey, Fletching, Wivelsfield (Early English); Ardingley and Slaugham (Decorated), and Cuckfield, Uckfield and Withyham (Perpendicular), all within a few miles of East Grinstead, will furnish ample field for measuring. L. G. R.

SOCIETY OF ARCHITECTS.

Coming of Age Dinner.

THE twenty-first annual dinner of the Society of Architects was held at De Keyser's Royal Hotel on Friday evening, the president, Mr. Walter W. Thomas, in the chair. The company numbered about 130. After the royal toasts had been given, the mayor of Marylebone (the Rev. Russell Wakefield, M.A.) proposed the toast of the Houses of Parliament, to which Lord Stanley of Alderley and Mr. C. McArthur, M.P., responded, the latter vouching his support of architects' registration "The London Local Authorities" was the next toast. In proposing this Mr. W. Watson Rutherford, M.P., of Liverpool, said he did not know whether the London County Council would be satisfied with the borough councils; he felt that there would be an awakening on both sides Speaking of by-laws, he observed that while architecture was undoubtedly improving in respect of large buildings, it was deteriorating in regard to common dwelling-houses, and this he ascribed in no small measure to unsatisfactory by-laws, which brought about a uniformity that made for squalidity and general want of comfort. The toast was responded to by Alderman Sir H. Knight (representing the City of London), Mr. J. Jeffery (for the London County Council), the mayor of Kensington—Councillor Percy Gates (for the borough councils) and Sir R. M. Beachcroft (for the Metropolitan Water Board). The mayor of Kensington said that since the borough councils came into existence in 1900 the average rates of the Metropolis had risen from 5s. 2d. to 6s. 3d., but only 1½d. of that increase was due to the local authorities, whose function it was to provide the necessary funds for the spending central bodies! He deprecated the idea of a uniform poor rate and a uniform general rate as being illogical and unfair. Sir R. M. Beachcroft observed that the Metropolitan Water Board had to provide thirty gallons a day each to seven million people, supplying water to a million houses, and while the area under the control of the London County Council was 120 sq. miles that of the Water Board was 620 sq. miles. He also alluded to the growth of London, and conjured up a picture of suburbs extending far into the Midlands on the one hand and down to the Channel on the other.

The toast of "The Society of Architects and Architecture" was given by Mr. L. A. Atherley Jones, K.C., M.P., who regretted that registration had not become law: it was extremely improbable that the Bill would pass this session of Parliament.

The Society's Position in regard to the Registration Bill.

The president (Mr. Walter W. Thomas) and Mr. Cholton James, F.R.I.B.A. (president of the Cardiff, South Wales and Monmouthshire Architects' Society) responded. Mr. Thomas congratulated the members on the position which the Society had attained. Both in finances and membership it was never in a better position to carry on the objects for which it was founded. The chief of these, as they all knew, was the statutory education and registration of architects, and it really seemed as though they were on the eve of realising their desire. It was no longer a question as to whether the profession was in favour of registration or not—the Society of Architects had settled that question by a poll of the profession some years ago—but whether there should be two Bills before Parliament or one Bill promoted by the Institute and unanimously supported by the profession, including the Society. He repeated that the latter was prepared to stand aside in favour of the Institute if that body was prepared either to adopt the present Bill or to substitute another one of a character to satisfy the members of the Society of Architects that the principle which they had so long upheld should be adhered to. The next move was with the Institute. "If they are in earnest we shall be able to approach Parliament with a united front. If, unfortunately, other councils prevail, the lead will be with us again, and we shall not fail to take advantage of it. We are pledged to see the matter through and are quite certain of success in the long run."

Modern Workmen.

The toast of "The Arts and Crafts allied to Architecture" was given by the Lord Mayor of Liverpool (Councillor John Lea, J.P.) and responded to by the mayor of Holborn (Alderman Fitzroy Doll, F.R.I.B.A.). Mr. Doll said that nowadays our sympathies were more with the builder and craftsman than they used to be. The master-builder, however, had become little more than a cashier, and the workmen, he regretted to say, were often unworthy of their hire: he noted, too, what a vast army of foreigners were employed in this country—Belgian, Italian and French asphalt-layers, mosaic workers and plasterers, Swedish and Dutch joiners, and German parquet-floor layers. This state of affairs he laid largely at the door of improperly conducted trades-unionism; and he predicted that unless our technical education was made equal to that on the Continent we should sink still further into the mire.

Mr. A. E. Pridmore proposed the toast of "Our Guests," and Mr. George Hubbard, F.R.I.B.A., responded.

Current Market Prices.

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Deals, Kemi, Yellow, 1st & 2nd, 4×11	per std.	11	5	0		—	
Do. do. do. do. 3×9	do.	10	15	0		—	
Do. Archangel, White, 1st, 3×11	do.	13	0	0		—	
Do. do. Yellow, 3rd, 3×11	do.	10	5	0		—	
Do. Orrefors, Yellow, 1st & 2nd, 3×11	do.	8	5	0		—	
Do. St. Petersburg, Yellow, 1st, 3×9	do.	11	0	0	12	0	0
Do. do. do. 2nd, 2¼×7	do.	9	15	0		—	
Do. do. do. Unsorted, 3×9	do.	10	0	0		—	
Do. Skelleftea, Yellow, 4th, 3×9	do.	10	0	0		—	
Do. Gothenburg, Yellow, 3rd, 3×9	do.	9	15	0		—	
Do. Bergvik Yellow, 4th, 3×9	do.	8	10	0		—	
Do. Soderhamn, Yellow, Unsorted, 3×9	do.	7	0	0		—	
Do. Petschora Yellow, 2nd, 3×8	do.	11	5	0		—	
Do. Quebec, Spruce, 1st, 3×9	do.	12	5	0		—	
Do. do. do. 2nd, 3×9	do.	9	5	0		—	
Do. do. do. 3rd, 3×9	do.	8	15	0		—	
Do. do. do. 4th, 3×11	do.	8	10	0		—	
Battens, all kinds ...	do.	6	0	0	13	0	0
Flooring Boards 1in. prepared, 1st... ...	per square	0	10	6		—	
Do. 2nd	do.	0	9	9		—	
Do. 3rd, &c.	do.	0	7	0	0	8	0

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ...	per ton	79	0	0		—	
Iron, Staffs., bar ...	do.	5	15	0	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	7	6		—	
Lead, pig, Soft Foreign...	do.	13	0	0		—	
Do. do. English common brands	do.	13	5	0		—	
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14	0	0		—	
Do. pipe	do.	15	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	5	0		—	
Do. floor brads... ...	do.	9	0	0		—	
Steel, Staffs., Girders and Angles	do.	5	7	6	5	12	6

Keystones.

Mr. Arthur E. Sheppard has commenced practice as an architect and surveyor at 39, High Street, Newport, Mon.

An Article on the Development of Architectural Art, by Miss Ethel Charles, A.R.I.B.A., appears in the R.I.B.A. Journal for May 20th.

Mr. Herbert J. Finn has been commanded to wait upon the King with selections of his architectural drawings. Mr. Finn's exhibition at 114, New Bond Street is open till the end of this month.

The Length of London's Roman Wall found in Jewry Street, Aldgate, as reported on p. 281 of our issue for last week, is to be preserved, and the new building adjoining is to be called "Roman House."

Messrs. George Wragge, Ltd., have taken new premises adjoining their showroom in Shaftesbury Avenue, so as to provide accommodation for an increased staff and an increasing business in London. Their numbers in Shaftesbury Avenue are now 209 and 211.

County Asylum Architects.—At the annual meeting of the County Councils Association held last week at Westminster Mr. J. Willis Bund (Worcester) said there was something like a "ring" of architects for the erection of county asylums. Certain architects were well known to the Lunacy Commissioners and knew their wishes and requirements, and unless the work were given to one of these architects life was made a burden. It was decided to call the attention of the Government to the subject.

A Ventilation Contract.—One of the largest contracts of its kind ever given out has just been secured by the Sutcliffe Ventilating and Drying Co., Ltd., of Manchester, for warming and ventilating the new soapery which Messrs. Lever Brothers are building at Port Sunlight. This will be a huge place covering 5 acres of ground. Messrs. William & Segar Owen, of Warrington, are the architects. The building will be warmed and ventilated on the plenum system. Five large steel-plate fans will supply more than 3,000 cub. ft. of fresh air, warmed or cooled as desired, to every person employed in the building.

Manchester Society of Architects.—On May 2nd this Society began its summer programme of visits, about thirty members going to the Church of the Christian Scientists, Victoria Park (Mr. Edgar Wood, architect). The entrance forecourt exhibits picturesque grouping of simple and unusual character, and the interior, when completed to double its present length, will be very satisfactory; the whole design shows considerable individuality and suitability to its purpose. Afterwards the members visited St. Chrysostom's Church to study the effects of the recent fire, finding very complete proofs of the unreliability of stone when exposed to heat and water. On May 6th a visit was paid to Leeds to see the new Roman Catholic Cathedral (Mr. J. H. Eastwood, architect). Under the guidance of the clerk of works considerable time was spent in thoroughly examining the building, and much of interest was found both in detail and in general design. The party then divided, and utilized the little remaining time in making flying visits to Kirkstall Abbey and to Mr. Bodley's fine church at Allerton.

The Buxton Sewage Works were visited recently by M. Bernard Bezault and M. Arthur Vye-Parminter (architect to His Majesty's Embassy at Paris), members of the deputation of eminent French engineers who are in this country inspecting some of the principal sewage purification works on behalf of the French Government. The sewage at Buxton is treated by chemical precipitation and continuous filtration, being distributed over the beds by means of Adams' Cressett revolving distributors. The opinion expressed after the inspection was: "The finest and the cleanest works we have ever been in, and the results achieved are excellent." The works were designed by Mr. W. Hedley Grieves, surveyor and engineer to the Buxton Urban District Council, and were opened on the occasion of the meeting of the Association of Municipal and County Engineers held at Buxton about twelve months ago.

The Marble Baldachino in Westminster Cathedral is to be erected shortly.

Mr. C. B. Fowler, F.R.I.B.A., late of Cardiff and London, has entered into partnership with Mr. W. H. Shute, of "Western Mail" Chambers, Newport, Mon., where they are practising as architects and surveyors. They are agents for several estates, and are carrying out extensive additions, &c., to Llantarnam Abbey, the residence of Mr. Clifford Cory, J.P., High Sheriff of Monmouthshire.

Trade and Craft.

An Illustrated Price-Book.

It will be recollected that a few years ago Messrs. Young & Marten, Ltd., the well-known firm of builders' merchants, of Caledonian Works, Stratford, issued a most elaborate and sumptuously produced catalogue in two volumes which cost them nearly £10,000, creating a reputation for catalogues which they have systematically maintained by the issue of smaller illustrated price-lists. The latest production is their No. 28 Tariff, measuring 12ins. by 10ins. and numbering 460 pp. This is extremely well got up with numerous coloured plates, and is most complete in every detail, with the latest designs. The increasing multitude of little details that enter into modern building operations makes it necessary for everyone concerned, to keep up to date, and it is of the greatest importance to have such a full record as this, with illustrations, sizes, weights, prices, &c. The Tariff enumerates goods regularly kept in stock in large quantities to meet the urgent and increasing demands of the trade for promptitude in supply. In judging the prices in trade catalogues it is well to recollect that the lowest price is not always the cheapest. Messrs. Young & Marten's goods, while they compare well with any on the market for price, are not cheap and nasty—utility is always studied by them, and they have ever striven to supply goods that give satisfaction to all concerned, and consistently eliminate the rubbishy type of goods. It is due to this that their business has grown so rapidly and so uninterruptedly to its present huge dimensions; for their many customers, finding themselves well served, come again. Another advantage the firm offers is that in its showrooms at Stratford the whole of the designs shown in this Tariff are displayed, so that customers can see the goods before buying. The catalogue is a necessity for those who wish to keep themselves in touch with practical construction, and all who are interested should apply for a copy.

Obituary.

Mr. William Horobin, J.P., painter and decorator, of Oldham, died recently in his seventy-ninth year.

Mr. William Crozier, M.I.C.E., late county surveyor, engineer and architect for Durham, died recently in his seventy-sixth year. He reconstructed the assize courts at Durham and the moot hall at Newcastle, and under his direction the Durham Lunatic Asylum was enlarged to accommodate 1,300 patients.

Complete List of Contracts Open.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		BUILDING:		
May	25	Carharrack—Wesleyan School	——	Sampson Hill, Green Lane, Redruth.
,,	25	Nelson, Lancs—Market Stalls	Market and Library Committee.	B. Ball, Borough Engineer, Nelson.
,,	25	Porth, Wales—Conversion of School into One Department	Education Committee	J. Rees, Hillside Cottage, Pentre.
,,	25	Cuxton, Kent—School	Education Committee	G. E. Bond, 384 High Street, Rochester.
,,	25	Darton, near Barnsley—Two Blocks of Houses	——	R. & W. Dixon, 5 Eastgate, Barnsley.
,,	25	Dowlais, Wales—Shop, &c.	——	C. M. Davies, 112 High Street, Merthyr.
,,	25	London, N.W.—Columbarium	Hampstead Borough Council	A. P. Johnson, Town Hall, Hampstead.
,,	25	Merthyr, Wales—Rebuilding Shop	——	C. M. Davies, 112 High Street, Merthyr.
,,	25	Weymouth—Entrance Gates, &c.	Urban District Council	Borough Engineer's Office, Municipal Offices, Weymouth.
,,	26	Masham, Yorks—Chapel, &c.	——	Rev. F. Lucas, 26 College Road, Ripon.
,,	26	Aldeburgh, Suffolk—Engine-house	Corporation	J. C. Gordon, Aldeburgh.
,,	26	Warrenpoint—Erecting and completing Orange Hall	——	S. W. Reside, Margaret Square, Newry.
,,	26	Aston Manor—Urinal	Town Council	Borough Surveyor, Council House, Aston Manor.
,,	26	Manchester—School...	Education Committee	W. Talbot, Town Clerk, Manchester.
,,	26	Wortley—Caretaker's Cottage	Rural District Council	G. E. Beaumont, Greenside, near Sheffield.
,,	26	Barnstable—Two Sheds	Urban District Council	Borough Surveyor's Office, Barnstaple.
,,	27	Perranporth, Cornwall—Additions to House	——	A. J. Cornelius, Truro.
,,	27	Felling, Durham—Additions to School...	Urban District Council	H. Millar, Council Buildings, Felling.
,,	27	Sheffield—Hospital	Guardians	H. I. Potter, 24 Norfolk Road, Sheffield.
,,	27	Lancaster—Mason's Work in Erection of Balustrade Wall	Visiting Committee	Clerk of Work's Office, Lancaster.
,,	27	Lumphanan, N.B.—New Wing to Offices	——	Tenant, "Sunnybrae," Park Hill, Lumphanan.
,,	27	Merther, Cornwall—Cattle Shed	——	Farmhouse, Tresawson.
,,	27	Perranporth, Cornwall—Additions to House	——	A. J. Cornelius, Truro.
,,	27	Strathspey, N.B.—Residence	——	A. Maitland & Sons, Tain.
,,	27	Aviemore, N.B.—Six Dwellings	Highland Railway Co.	W. Roberts, Company's Engineer in Chief, Inverness.
,,	28	Tralee, Ireland—Residence	Mr. W. H. McCowen	R. Walker & Sons, 17 South Mall, Cork.
,,	29	Swansea—Five Pairs of Semi-detached Houses	Co.-op. Building Club	C. T. Ruthen, Bank Chambers, Heathfield Street, Swansea.
,,	29	Lossiemouth, N.B.—Business Premises	——	R. B. Pratt, Town and County Bank Buildings, Elgin.
,,	29	Ferrybridge, Yorks—Signal Cabin	N.E. & Midland Railway	W. J. Cudworth, Company's Engineer, York.
,,	29	Mountain Ash—School, &c.	Urban District Council	W. G. Thomas, Public Offices, Mountain Ash.
,,	30	Houghton-le-Spring, Durham—Walls	Guardians	Master of Workhouse, Houghton-le-Spring.
,,	30	Kensworth, Beds—Hospital	Joint Committee	G. Simcox, Town Hall, Dunstable.
,,	30	London, E.—Library	Leyton U.D.C.	W. Jacques, 2 Fen Court, Fenchurch Street, E.C.
,,	30	Wheatley Hill—Alteration, &c., to School	Education Committee	County Education Offices, Wheatley Hill.
,,	30	Polgooth—Two Cottages	Messrs. Coon Brothers	F. Coon, Rose View Farm, London Apprentice, St. Austell.
,,	31	Southwick, near Sunderland—Forty-two Houses	N.E. Railway Co.	W. Bell, Central Station, Newcastle-on-Tyne.
,,	31	Saxmundham—Repairs to Cottage	Town Lands Trust	J. Fry, Solicitor, Saxmundham.
,,	31	Bury—Pulling-down Old Market...	Corporation...	Borough Engineer, Bury.
June	1	Pontefract—Completion of Cottage Homes	Guardians	Garside & Pennington, Pontefract.
,,	3	Dublin—Training College Building	Commissioners	J. F. Fuller, 179 Great Brunswick Street, Dublin.
,,	3	Beverley—Infants' School	Education Committee	Hawe & Foley, North Bar Street, Beverley.
,,	3	Glasnevin, Ireland—Residence	Commissioners	J. F. Fuller, 179 Great Brunswick Street, Dublin.
,,	3	Lancaster—Balustrade Wall	——	Borough Surveyor's Office, Lancaster.
,,	5	Stranorlar, Ireland—Twenty-three Cottages...	Rural District Council	Workhouse, Stranorlar.
,,	5	Wivenhoe, Essex—Alterations, &c., to Board School	Education Committee	F. Whitmore, Duke Street, Chelmsford.
,,	5	Ipswich—Enlargement of School	Education Committee	Bisshapp & Cautley, 32 Museum Street, Ipswich.
,,	7	Talgarth—Alteration to Farmhouse	Visiting Committee	Clerk's Offices, Asylum, Talgarth.
,,	7	London, N.—Extension of Hospital	Town Council	E. J. Lovegrove, Municipal Offices, 99 Southwood Lane, Highgate, N.
No date		Duddo, Northumberland—New Schoolmaster's House	——	Arthur B. Plummer, F.R.I.B.A., Diocesan Architect, Newcastle.
,,		Chevington, Northumberland—New Parochial Building	——	do. do. do.
		ENGINEERING:		
May	25	Scunthorpe—Reservoir	Urban District Council	A. M. Cobban, Home Street, Scunthorpe.
,,	25	London, N.E.—Artesian Well	Hackney Borough Council	R. Hammond, 66 Victoria Street, S.W.
,,	27	Bangour, N.B.—Electric-light Plant	District Lunacy Board	H. J. Blanc, 25 Rutland Square, Edinburgh.
,,	27	Castlerea, Ireland—Waterworks	District Council	District Council Office, Castlerea.
,,	27	Findhorn and Kinloss, N.B.—Waterworks	County Council	Gordon & Co., Engineers, Inverness.
,,	27	Harrogate—Waterworks	Corporation...	E. W. Dixon, 14 Albert Street, Harrogate.
,,	27	Rannoch, N.B.—Embankment	——	A. Gillies, Finnart, Rannock Station.
,,	27	Tonyrefail, Wales—Heating Apparatus	County Council	Glamorgan County Offices, Westgate Street, Cardiff.
,,	29	Bury, Lancs—Boilers	Guardians	A. Hopkinson, Agier Street, Bury.
,,	29	Roa, Spain—Waterworks...	——	Offices of the Secretary of the Ayuntamiento, Roa.
,,	29	Kettering—Lamps, &c.	Urban District Council	John Bond, Council Office, Kettering.
,,	30	Sydney, New South Wales—Refuse Destructor	Municipal Council...	Acting Agent-General for State of New South Wales, Victoria St., S.W.
,,	30	Blackburn—Cooking Appliances	Guardians	F. C. Raddle, 4 King Street, Blackburn.
,,	30	Edinburgh—Extension Switchboard Panel	Corporation...	Engineer, Dewar Place Station, Edinburgh.
,,	31	Flushing, Cornwall—Reservoir	Rural District Council	J. P. Jenkins, Town Hall, Penryn.
,,	31	Ramsbottom, Lancs—Filters, &c.	Urban District Council	Diggle & Son, Hind Hill Street, Heywood.
June	1	Glasgow—Machinery	Corporation	Office of Public Works, City Chambers, 64 Cochrane Street, Glasgow.
,,	1	Much Haddam, Herts—Waterworks	Rural District Council	A. G. Gwynn, Bishops Stortford.
,,	2	Northam, Herts—Sinking Well, &c.	Gas and Water Co.	Company's Offices, New Barnet.
,,	7	Bristol—Electric Cranes	Docks Committee	William Squire, Cumberland Basin, Bristol.
,,	7	Mode Wheel, near Manchester—Dry Dock, &c.	Ship Canal Dry Docks Co.	Company's Offices, Mode Wheel.
,,	14	South Brent, Devon—Waterworks	Totnes R.D.C.	R. H. Worth, 42 George Street, Plymouth.
		IRON AND STEEL:		
May	27	Teignmouth—Purifier Covers	Urban District Council	J. A. Gray, Gas Manager, Urban Council, Teignmouth.
,,	30	London, W.—Girder Work	Great Western Railway Co.	Engineer, Paddington Station, W.
June	3	Glasgow—Ironmongery	Trustees of Clyde Navigation	Superintendent of Stores, 16 Robertson Street, Glasgow.
,,	5	London, N.—Lamp Columns	Hornsey Borough Council	E. J. Lovegrove, Municipal Offices, Southwood Lane, Highgate, N.
Sept.	1	Sydney, Australia—Iron and Steel	——	Agent-General's Office, 9 Victoria Street, S.W.
		PAINTING AND PLUMBING:		
May	26	Hertford—Painting, &c., to Building	Joint Hospital Board	Matron, Hertford and Ware Hospital.
,,	26	Leavesden, Herts—Painting Work at Asylum	Metropolitan Asylums Board	Offices of Board, Embankment, E.C.
,,	26	Salford—Painting Wood and Ironwork	Electricity Committee	Borough Electrical Engineer, Frederick Road Works, Pendleton.
,,	27	Runcorn—Painting Exterior of Workhouse	Guardians	G. F. Ashton, 71 High Street, Runcorn.
,,	29	London W.—Whitewashing, &c., Interior of Asylum	Managers	Central London Sick Asylum, Cleveland Street, Fitzroy Square, W.
June	5	London, E.—Re-decorating Library	Stepney Borough Council	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
,,	8	Bootle, Lancs—Painting at Schools	Corporation...	Borough Engineer's Office, Town Hall, Bootle.
		ROADS AND CARTAGE:		
May	26	Guildford—Road Material	Rural District Council	J. Anstee, Council Offices, Commercial Road, Guildford.
,,	27	Anstruther Wester, N.B.—Paving	Town Council	J. & T. W Currie, Elie.
,,	27	Clayton-le-Moors, Lancs—Street Works	Urban District Council	A. Dodgeon, Surveyor, Clayton-le-Moors.
,,	28	Tynemouth—Paving, &c.	——	J. F. Smillie, Borough Surveyor, Tynemouth.
,,	29	Camberley, Surrey—Kerbing, &c.	Frimley U.D.C.	T. C. Jones, Surveyor, Council Offices, Camberley.
,,	29	Nottingham—Asphalting	——	Poor Law Offices, Nottingham.
,,	29	Rugeley—Road Material	Urban District Council	W. E. Rogers, Surveyor to Council, Anson Street, Rugeley, Staffs.
,,	30	Hadleigh, Suffolk—Granite	Urban District Council	C. J. Grimwade, U.D.C. Offices, Hadleigh.
,,	30	Bridgend, Wales—Court	Urban District Council	M. Williams, 3 Union Street, Bridgend.
,,	30	West Hartlepool—Streets...	Corporation...	N. F. Dennis, Borough Engineer, West Hartlepool.
,,	30	Cramlington—Rolling, &c.	Urban District Council	W. J. Coulson, Cramlington.
,,	31	Hove, Sussex—Works and Materials	Corporation...	H. H. Scott, Town Hall, Hove.
June	6	Wembley, Middlesex—Widening, &c., Road	County Council	H. T. Wakelam, Guildhall, Westminster.
,,	14	Watford—Making-up Roads	Urban District Council	D. Waterhouse, Surveyor, Watford.
		SANITARY:		
May	26	Burslem, Staffs—Sewage-disposal Works	Corporation	F. Bettany, St. John's Chambers, Burslem.
,,	27	Saltwood, Kent—Sewer	Elham R.D.C.	R. Lonergan, 11 Cheriton Place, Folkestone.
,,	29	Falkland, N.B.—Sewerage Works	Town Council	G. S. Carfrae, 1 Erskine Place, Edinburgh.
,,	30	Bootle, Lancs—Sewer	Corporation	B. J. Wolfenden, Borough Engineer, Bootle.
,,	30	Christchurch, Hants—Sewerage Works	Corporation	E. J. Legg, Town Hall, Christchurch.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	SANITARY—*cont.*		
June 5	Prestwich, Lancs—Sewering	Urban District Council	Surveyor's Office, Chester Bank, Prestwich.
" 6	Brentford—Sewer	Urban District Council	Nowell Parr, Clifden House, Boston Road, Brentford.
" 7	Glasgow—Sewers	Corporation...	City Engineer, City Chambers, 64 Cochrane Street, Glasgow.
	TIMBER:		
June 3	South Hetton, near Sunderland—Colliery Timber	South Hetton Coal Co., Ltd. ...	J. A. Lambert, South Hetton.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
May 24	Harrogate—Orphanage	——		Rev. J. T. Barkley, Riche Mont, Harrogate.
June 1	Donegal—Lighting Scheme	——	10s.	D. C. Pearson, Clerk, Donegal.
Aug. 1	Perth—Reconstruction of Hall...	30, 20 and 10 guineas	——	J. Begg, City Chambers, Perth.
" 1	Perth—Erection of new Hall	50, 30 and 20 guineas	——	J. Begg, City Chambers, Perth.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Beltingham (Northumberland).—Accepted for the erection of an organ chamber. Mr. Arthur P. Plummer, F.R.I.B.A., M.R.S.I., diocesan architect, Newcastle:—

G. Wilson, Bardon Mill.

Boston.—For the erection of a new infirmary, laundry, boiler-house and mortuary at the workhouse, for the Guardians. Mr. James Rowell, architect, Church Lane, Boston:—

Richardson Brothers, Old Leake ...	£10,250	0	0
W. Hopkins, Birmingham	7,777	0	0
F. M. Thompson & Son, Louth ...	7,689	0	0
B. Crookes, Woodhall Spa	7,516	15	3
S. Sherwin & Son, Boston	7,494	0	0
J. H. Vickers, Nottingham	7,115	0	0
Bowman & Sons, Stamford	7,100	0	0
G. Greenfield, Sibsey	6,990	16	0
J. Young, Derby	6,900	0	0
Elmes, Gainsborough...	6,880	0	0
Langley & Son, Kirton	6,757	0	0
J. Lucas, Boston	6,290	0	0
F. Parker,* Wormgate, Boston ...	5,995	0	0

* Accepted provisionally.

Brampton.—Accepted for the erection of church tower. Mr. Jack, architect, London:—

J. Laing & Son, contractors, Carlisle.

Brentford.—Accepted for the erection of additional classrooms, &c., to Ealing Road Council School, for the Middlesex County Council. Mr. F. H. Pownall, architect, Guildhall, Westminster:—

T. H. Kingerlee & Sons, Oxford £1,716

Bridgwater. — For the erection of new central premises, for the Industrial Co-operative Society, Ltd. Mr. John Wyatt Hill, architect, King Street Chambers, Bridgwater. Quantities by architect:—

Walters & Son, Bristol	£2,467	0	0
Colborne, Swindon	2,278	5	0
T. Stockham	2,199	0	0
Gleed Brothers	1,989	18	4
Westbury & Jarman	1,849	0	0
F. Scott	1,720	0	0
J. E. Fursland	1,700	0	0
A. Glen	1,698	0	0
C. Bryer, junr.*	1,600	0	0

* Accepted. [Rest of Bridgwater.]

Cardiff.—For panelling and seating of the council-chamber in the new town hall. Messrs. Lanchester & Rickards, architects, London, W.C.:—

Smer & Cobay, Ltd.	£5.523	0	0
W. H. Lascelles & Co., London ...	4,850	0	0
C. Sims & Co., Holborn	4,500	0	0
Inglesant & Sons, Ltd., Leicester ...	4,365	0	0
Elliott's Moulding and Joinery Co., Newbury	4,229	0	0
J. Garvey & Sons, London	3,986	0	0
Scott Brothers, Salford	3,972	0	0
P. E. Gane, Cardiff	3,728	0	0
Stephens, Bastow & Co., Bristol ...	3,697	0	0
S. J. Waring & Sons, London... ...	3,623	0	0
J. Patch & Sons, Lancaster	3,595	0	0
Gillow & Co., Lancaster	3,562	0	0
Morton & Son, Ltd., Liverpool ...	3,533	0	0
Goodall, Lamb & Highway, Ltd., Manchester	3,499	0	0
Shapland & Petter, Barnstaple ...	3,485	0	0
W. I. Vaughan, Cardiff	3,384	4	9
E. Turner & Sons, Cardiff	3.358	0	0
Alden Brothers & Davies, London ...	3,231	0	0
J. P. White, Bedford	3,087	0	0
Mayward & Winter, Bath	3,969	0	0
North of England School Furnishing Co., Ltd., Darlington	2,930	15	6
J. Plucknett & Co., Warwick	2,660	0	0
Dart & Francis, Crediton	2,597	0	0
H. H. Martyns & Co.,* Cheltenham	2,135	0	0

* Accepted.

Corby.—For the erection of a pair of cottages, for the Kettering Industrial Society, Ltd. Messrs. Bird & Batley, architects, Kettering:—

R. R. Colyer	£697	3	0
J. Streather & Son	630	0	0
C. & F. Henson...	616	0	0
Smith & Edmunds	608	0	0
Kettering Co-operative Builders... ...	598	0	0
O. P. Drever	574	0	0
C. Andrew	£568	0	0
H. Judkins	566	0	0

Devonport—For re-building the "Stoke Inn" and adjoining premises, Tavistock Road, Stoke, for Mr. Ralph. Mr. Edgar M. Leest, architect. Messrs. Leest & Adams, quantity surveyors:—

H. Pile & Son...	£2,209	10	0
G. H. Smith & Son	1,965	15	0
W. Littleton & Son	1,886	0	0
Pearce Brothers*	1,658	0	0

* Accepted.

Devonport.—For the erection of stables at rear, No. 28, Trafalgar Place, Stoke, for Mr. Hawken. Mr. Edgar M. Leest, architect:—

F. Watts	£179	15	0
S. Perkins	179	10	0
H. Pile & Son	143	10	0
W. Littleton & Son	134	10	0
G. H. Smith & Son*	132	15	0

* Accepted.

Ilford.—Accepted for forming new filter-beds and providing filter material at the outfall works, Water Lane, for the Ilford Urban District Council. Mr. H. Shaw, A.M.I.C.E., surveyor:—

D. T. Jackson, 104, Ripple Road, Barking £10,328 13 11

Isham.—For the erection of a country house, for Mr. George Randall. Messrs. Bird & Batley, architects, Kettering:—

E. Brown & Son	£797	10	0
Berrill & Green...	789	0	0
Capps, Rowley & Keach	768	0	0
A. Lewis	765	0	0
A. Lewis & Son	763	0	0
Smith & Edmunds	762	0	0
C. & F. Henson...	756	0	0
A. J. Ball	754	0	0
C. Lewis	750	0	0
Kettering Co-operative Builders... ...	744	0	0

Kettering.—For the supply and fixing of rainwater storage tank, for the Co-operative Corset Society, Ltd. Messrs. Bird & Batley, architects, Kettering:—

C. & F. Henson	£93	10	0
A. Bamford	78	10	0
Smith & Edmunds	78	0	0
Kettering Co-operative Builders	71	10	0

Leeds.—For the erection of Leeds Girls' Grammar School at Headingley, for the Committee. Messrs. Connon & Chorley, architects, 16, Park Place, Leeds. Quantities by architects:—

I. Gould	£19,404	0	0
Armitage & Hodgson...	18,927	0	0
W. Irwin & Co.	18,657	0	0
B. Graham	18,030	0	0
W. Lolley	17,775	8	0
H. Atkinson & Sons	17,565	0	0
J. Tomlinson & Sons	17,490	0	0
W. Wilson & Son	17,462	0	0
T. Hannam	17,460	0	0
J. Pullan...	17,327	0	0
J. T. Wright	17,165	0	0
P. Rhodes	17,096	0	0
W. Nicholson & Sons	16,950	0	0
W. Aircy,* Leeds	16,750	0	0

* Accepted.

London, S.E.—For the erection of two shops on the site of "Ferndale," Rushey Green, Catford, for Mr. S. S. Brush. Messrs. Norfolk & Prior, architects, 4, Station Buildings, Catford Bridge—

		A.
J. Lawrence	£2,015 ...	—
T. D. Leng	1,614 ...	£55
C. Walker	1,425 ...	40
J. Watt	1,390 ...	50

A.—Allowance for material on site.

London, S.E.—Por rebuilding 2 and 4, Choumert Road, Peckham, for Mr. R. Price. Mr. T. Wilson, architect, 34, New Bridge Street, E.C.:—

C. Wall, Ltd.	£1,092
Nightingale	1,059
Lidstone	1,026
Leslie & Co.	1,025
Coleman & Co.	1,020
J. Chessum & Sons*	1,019

* Accepted.

London, S.E.—For the erection of heater-room at the Brook Hospital, Shooter's Hill, for the Metropolitan Asylums Board:—

E. Proctor & Son, Plumstead	£2,380	0	0
Enness Brothers, Erith	1,957	0	0
Thomas & Edge, Woolwich	1,950	0	0
E. Wall, Tooting	1,703	0	0
Friday & Ling, Erith	£1,650	0	0
T. Cole,* 125-127, Offord Road, Barnsbury, N.	1,644	18	0

[Engineer-in-chief's estimate, £1,900.]

* Accepted.

London, W.—For the erection and completion of a lecture-hall in Uxbridge Road, Hanwell. Messrs. W. G. Tutt and Goodchild, architects, 18 and 19, Ironmonger Lane, Cheapside, E.C. Quantities by Mr. F. D. Hickman, 18 and 19, Ironmonger Lane, Cheapside, E.C.:—

Snewin Brothers	£4,660	0	0
H. S. Cove	4,450	0	0
J. C. Mather	4,430	0	0
C. Brightman	4,390	0	0
J. Ferguson & Co....	4,387	10	0
J. Stewart	4,384	0	0
J. Burgess & Sons...	4,375	0	0
A. Leather	4,341	0	0
G. Godson & Sons	4,250	0	0
J. F. Holliday...	4,200	0	0
Banyard & Son	4,181	0	0
H. Willcock & Co.	4,164	0	0
L. F. Lamplough	4,129	0	0
B. E. Nightingale	4,100	0	0
Johnson & Co.	4,094	0	0
Mattock & Parsons	4,093	0	0
Battley, Sons & Holness	4,071	0	0
Chinchen & Co.	4,056	0	0
Wisdom Brothers	4,049	0	0
Aldridge & Son	4,033	0	0
T. H. Kingerlee & Sons	3,997	0	0
W. J. Dickens	3,997	0	0
W. Lawrence & Sons	3,974	0	0
Oak Building Co., Ltd.	3,970	0	0
M. E. Fitt	3,970	0	0
G. H. Gibson	3,958	0	0
J. Christie	3,943	0	0
H. Flint	3,887	0	0

Morpeth.—For the erection of proposed new premises for the Ashington Industrial Co-operative Society, Ltd. Messrs. Liddle & Browne, architects, Prudential Buildings, Mosley Street, Newcastle-on-Tyne:—

S. Sheriff, South Shields	£3,918	11	8
Jeffrey Brothers	3,239	8	3
W. Worley, jun., Newcastle	3,217	0	0
J. Bewley, Dunstan-on-Tyne	3,215	18	7
R. Carr & Son, Amble...	3,188	6	9
G. & C. Haswell	3,185	13	0
E. T. George, Newcastle-on-Tyne ...	3,130	0	0
J. Jackson & Son, Newcastle	3,118	0	0
Franklin & Son, Newcastle-on-Tyne	3,115	9	10
W. E. Hall, Low Fell, Gateshead ...	3,092	2	7
J. Browell, Blaydon-on-Tyne	3,072	3	11
W. H. Braithwaite, Heaton, Newcastle	2,985	0	0
J. & G. Douglas, Hepscott, Morpeth	2,949	19	9
J. Weallans	2,909	5	0
G. Dixon...	2,896	13	6
R. Storey, West Boldon	2,886	5	0
W. Kennedy & Son, Jarrow	2,742	2	3
Gordon Brothers,* Chippington, near Morpeth	2,736	19	2

* Accepted. [Rest of Morpeth.]

Norwich.—For the erection of a a new masonic club. Mr. A. C. Havers, architect:—

J. S. Smith	£2,700
J. Boddy & Son	2,516
J. Anderson & Son	2,497
R. Daws & Son	2,489
Scarles Brothers	2,465
J. Evans	2,455
J. Youngs & Son*	2,425
Greengrass	2,400
A. E. Chapman	2,399
Gill...	2,397

* Accepted. [Architect's estimate £2,400.]

Sheffield. — Accepted for alterations to the old administrative block at the infirmary, for the Board of Guardians:—

J. Eshelby & Sons £3,712 5 0

Sleekburn (Northumberland).—Accepted for the erection of a new church. Mr. Arthur B. Plummer F.R.I.B.A., M.R.S.I., diocesan architect, Newcastle:—

John Goulding, Blyth.

Southall.—Accepted for the erection of a new public elementary school, for the Middlesex County Council. Mr. F. H. Pownall, architect, Guildhall, Westminster:—

Goddard & Sons, Farnham... ... ... £14,268

(Continued on p. xviii.)

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SEE PAGES XV and XX FOR EMPLOYMENT REGISTER.

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See p. xx for the Employment Register.

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The Council do not bind themselves to accept the lowest or any Tender.

By Order,
D. G. MACDONALD, Assoc. M.Inst. C.E.,
Surveyor to the Council.

Rugby, May 4th, 1905.

COLCHESTER CORPORATION WATERWORKS.

TO CONTRACTORS BUILDERS, AND OTHERS,
NOTICE IS HEREBY GIVEN.

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By Order,
C. E. BLAND,
Waterworks Superintendent.

Town Hall, Colchester.
16th May, 1905.

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Note.—Owing to the large number of enquiries we receive weekly, we are compelled to restrict the advantages of this department to Regular Readers.

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1. Every regular reader of the BUILDERS' JOURNAL is entitled to the benefit of this Insurance.

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We have employed the term "Regular Reader" throughout these announcements as the description "subscriber" is often understood to mean one who subscribes direct to the publishing office.

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Those readers who order the BUILDERS' JOURNAL through their local newsagent or bookstall should send us the newsagent's receipt. Their names will then be placed on our subscribers' list, and they will be entitled to all the advantages set out above.

**5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS.
OFFICE: 6, GREAT NEW STREET, FETTER LANE, E.C.**

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending May 19th twenty-two failures in the building and timber trades in England and Wales were gazetted.

E. HAWKING, builder, Dawlish. R.O. May 13th.

W. HUGGINS, builder, Leyton. Adj. May 12th.

J. H. HAIRE, builder, Greenwich. R.O. May 11th.

T. M. TAYLOR, builder, Lower Ashstead. Adj. May 12th.

E. WARREN, builder, Addlestone. R.O. May 11th.

A. W. HEMISLEY, builder and plumber, Small Heath. R.O. May 9th.

A. CURTIS, jobbing bricklayer, Sudbury. R.O. May 13th.

R. T. PECK, plumber and decorator, Lowestoft. R.O. May 8th.

G. J. WALTON, painter and decorator, Bradford. P.E., Bradford C.C., May 31st, at 10.

J. J. BERRY, builder and contractor, Altrincham. Liability £1,397; deficiency £558.

A. E. MAGGS, late builder, Knowle. Liabilities £1,257; assets nil.

J. S. HANNAFORD, builder, Matley. Liabilities £2,421; £408 to rank for dividend; deficiency £203.

E. J. CHARLES, builder and contractor, Mosley. Discharge granted on Thursday last.

C. H. & J. MOULSON, builders and contractors, Birmingham. Discharge refused.

G. BECKER, merchant and timber broker, London, E.C. Adj. May 12th.

H. & F. FEARMAN, builders and decorators, London. Adj. May 12th.

J. T. MORRIS, builder, Newport, Mon. P.E., Newport Town Hall, June 8th, at 11.

E. DALTON & SON, joiners and builders, Buxton. First meeting, O.R.'s, Stockport, May 26th, at 11. P.E., Stockport C.C., May 31st, at 11.

A. E. LONGDEN, building contractor, Bristol. R.O. May 12th. First meeting, O.R.'s, Bristol, May 24th, at 11.45. P.E., Bristol Guildhall, June 23rd, at 12.

H. J. SHEPPARD, builder, Cheltenham. First meeting, Cheltenham C.C., May 25th, at 11.15. P.E., same, June 8th, at 12.

J. A. H. JAMES, joiner, Smallthorne. First meeting, O.R.'s, Newcastle, May 25th, at 12. P.E., Hanley Town Hall, May 31st, at 11,

J. & G. MASTON, builders, Otley. R.O. May 12th. First meeting, O.R.'s, Leeds, May 25th, at 12. P.E., Leeds C.C., June 19th, at 11.

W. WOOD, builder, Folkestone. R.O. May 10th. First meeting, O.R.'s, Canterbury, June 8th, at 9.30. P.E., Canterbury Guildhall, same day, at 10.

J. G. PICKARD, builder and contractor, Turner's Hill. R.O. May 8th. First meeting, Crown Hotel, East Grinstead, May 24th, at 12.15. P.E., Tunbridge Wells Town Hall, June 19th, at 2.30.

E. J. HODDINOTT, carpenter and builder, Milton. P.E., Southampton C.C., May 24th, at 12. First meeting, Midland Bank Chambers, High Street, Southampton, same day, at 3.

Coming Events.

Wednesday, May 24.
SOCIETY OF ARTS. — Mr. Killingworth Hedges, M.I.C.E., on "Modern Lightning Conductors," at 8 p.m.

Thursday, May 25.
CARPENTERS' COMPANY.—Mr. James Bartlett on "Joinery," at 7.30 p.m.

Saturday, May 27.
NORTHERN ARCHITECTURAL ASSOCIATION. — Students' Sketching Club Excursion.

Monday, May 29.
SURVEYORS' INSTITUTION.—Annual General Meeting, at 3 p.m.

Saturday, June 3.
NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to Whitley Schools, St. George's Church, Cullercoats, and Tynemouth Priory, &c.

ARCHITECTURAL ASSOCIATION. — Second Summer Visit.

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W. G. & L. ENGLAND, LTD., timber merchants, contractors, &c., Barnsley. Capital: £12,000.

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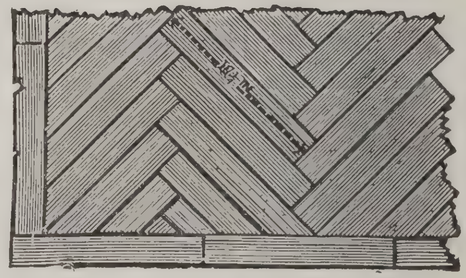

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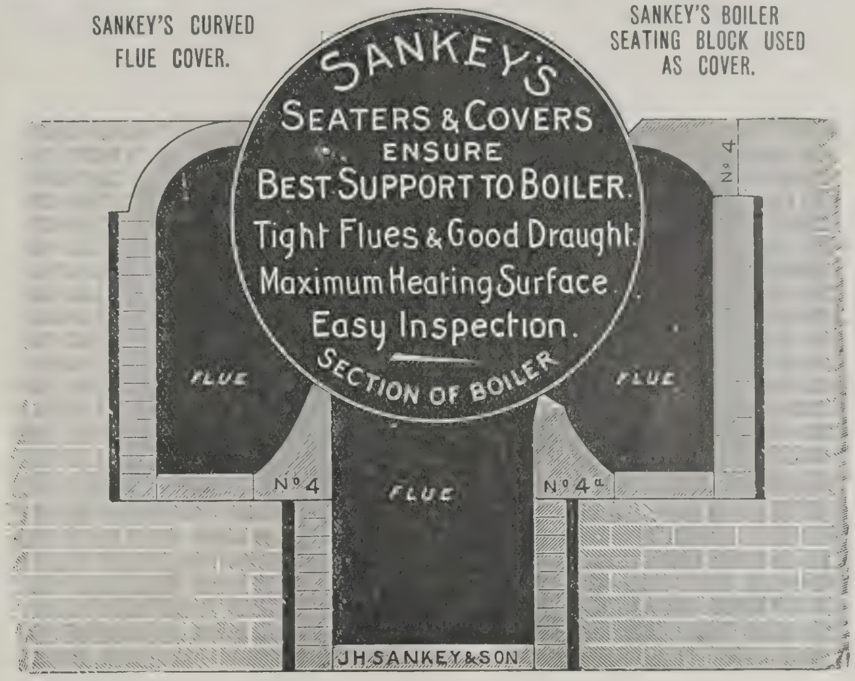

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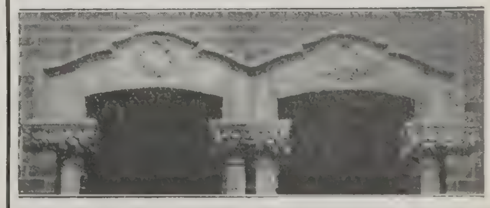

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TENDERS—*cont. from p.* xiii.

Bexley.—For the erection of a villa for men at the asylum, for the London County Council :—

C. Wall, Ltd.	£14,226	0	0
Patman & Fotheringham, Ltd.	13,533	0	0
Foster & Dicksee...	13,467	16	11
F. & F. H. Higgs...	13,000	0	0
H. L. Holloway	12,982	0	0
Holloway Brothers, Ltd.	12,857	0	0
Leslie & Co., Ltd.	12,795	0	0
H. Lovatt, Ltd.	12,845	19	8
Holliday & Greenwood, Ltd.	12,589	0	0
E. Lawrance & Sons	12,338	0	0
John Greenwood, Ltd.*	12,142	0	0

* Accepted.

Horton.—For the heating and ventilating of the Long Grove Asylum, for the London County Council :—

Newton Chambers & Co., Ltd.	£27,034
J. Howorth & Co.	25,792
Wenham & Waters	25,191
Körting Brothers	24,349
G. N. Haden & Sons	23,985
Sutcliffe Ventilating Co.	23,515
J. Keith & Blackman, Ltd.	23,017
Moorwood & Sons	22,119
R. Dawson & Co.	21,382
Ashwell & Nesbit	21,312
Dargue, Griffiths & Co....	20,057
Z. D. Berry & Sons	19,300
Lancashire Heating Co.	18,600
Lea & Warren...	18,575
T. Potter & Sons	17,279
Brightside Foundry Co.	16,891
Strode & Co.	16,483

Alternative Schemes.

Körting Brothers (patent low-pressure system)	24,985
Moorwood & Sons (atmospheric)	22,119
Ashwell & Nesbit (vacuum)	21,023
Dargue Griffiths & Co. (hot-water system)	20,057
Strode & Co.* (atmospheric)	19,536
Lea & Warren do.	18,895

* Accepted.

London.—For the supply of 750,000 stoneware ducts required for the electric cables in connection with tramways, for the London County Council :—

For 250,000 ducts.

J. J. Lee, Crumpsall, Manchester	£18,500	0	0
Naylor Brothers, Huddersfield	16,250	0	0
J. F. Cummings & Co., London	13,193	15	0
Ingham's Firebrick Co., Dewsbury	12,987	10	0
Sutton & Co., Ashby-de-la-Zouch...	12,875	0	0
T. Wragge & Son, Ltd., Swadlincote, Derbyshire	11,437	10	0
Hosea Tugby & Co., Ltd., Ashby-de-la-Zouch	11,437	10	0
H. R. Mansfield, Burton-on-Trent	11,437	10	0
J. Knowles & Co., London	11,437	10	0

For 750,000 ducts.

Stanley Brothers, Ltd.,† Nuneaton	10,250	0	0
G. Skey & Co., Ltd.,* London	9,481	5	0
The Stourbridge Glazed Brick and Fireclay Co., Ltd., Dudley	3,791	13	4

* Accepted for 500,000. † Accepted for 250,000.

London, W.—For the enlargement of the Portobello Road School, Kensington, for the London County Council :—

C. Wall, Ltd., Chelsea	£9,110
F. T. Chinchen & Co., Kensal Green	9,089
General Builders, Ltd., Notting Hill...	8,896
Leslie & Co., Ltd., Kensington Square	8,409
C. F. Kearley, 195B, Kensington High Street...	7,827
Rice & Son, 15, Stockwell Road	7,821
Lathey Brothers, Battersea Park	7,815
Lawrance & Sons, City Road	7,804
Patman & Fotheringham, Ltd., Islington...	7,781
J. Simpson & Son, 48, Paddington Street	7,663
Stimpson & Co., Battersea	7,590
E. Triggs, Clapham...	7,580
W. Johnson & Co., Ltd., Wandsworth Common	7,492
J. & M. Patrick,* Point Pleasant, Wandsworth...	7,290

* Recommended for acceptance.

Walworth.—For the erection of proposed girls' club in Villa Street. Messrs. Ernest Runtz & Ford, architects, 10, Walbrook, E.C. Quantities by Messrs. Franklin & Andrews :—

Mark Patrick & Son...	£2,980
Higgs & Hill, Ltd.	2,974
Howell J. Williams, Ltd.	2,957
J. Marsland & Sons	2,956
Holloway Brothers	2,880
T. Rider & Sons	2,868
T. Gough & Co....	2,854
Patman & Fotheringham, Ltd.	2,783
E. A. Roome & Co.	2,736
W. Irwin	2,695

Wigan.—For the erection of seventeen cottages in Spring Gardens, for the Corporation :—

R. McWally & Son, Wigan Lane	£2,730
I. Fletcher, Mariebonne Place	2,635
W. & I. Johnson, Vent Street	2,499
T. & H. Houghton, Newtown	2,497
D. A. Ablett, Sovereign Road	2,469
Birch & Clayton, Park Road	2,435
Howard & Sons, Upper Dicconson Street	2,424
Winstanley & Jackson, Church Street	2,363
M. Kerrigan, Hodges Street	2,363
J. Wilson & Co., Caroline Street...	2,337
Darbyshire & Collett, Kent Street	2,300
A. & I. Dean,* Crompton Street	2,210

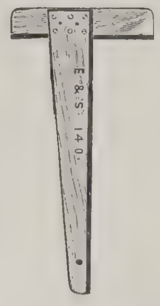
* Accepted. [All of Wigan.]

The Picturesque Church of St. Mary, Coslany, Norfolk, which was rebuilt in 1477, is in such a dilapidated state that it has been decided to apply for a faculty to sell the peal of six bells and pull the church down.

THE BUILDERS' JOURNAL SUPPLY DEPARTMENT.

List No. 1 of DRAWING OFFICE REQUISITES.

English Shaped T-Squares.



BEST MAHOGANY POLISHED T-SQUARES,

Extra Finish, Ebony Edged, Pegged and Keyed.

No. 140.

Length, 12 in. taper blade,	**1/6**	each.
„ 18 in. „	**2/3**	„
„ 24 in. „	**2/9**	„
„ 31 in. „	**3/6**	„
„ 36 in. „	**4/3**	„
„ 42 in. „	**5/-**	„
„ 48 in. „	**5/6**	„
„ 54 in. „	**7/6**	„

DRAWING BOARDS.

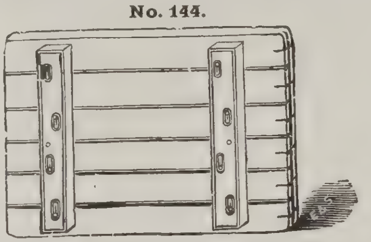
No. 151.

Each Board is stamped "E. & S. Triplex, 151."

Inches.		Each.
13×9½	Imperial 4to	**1/-**
16×11½	Imperial 4to (full size)	**1/6**
17×10½	Half Royal -	**1/6**
19×13½	Half Imperial	**1/9**
20×15½	Medium -	**2/-**
23×16	Half Imperial size)	**2/3**
22×17	Royal - -	**2/3**
24×19	Half Double Elephant	**3/-**
28×19	Imperial -	**3/6**
30×22	(Special) -	**4/6**
31×23	Imperial (full size)	**4/9**

ENGINEERS' & ARCHITECTS' DRAWING BOARDS.

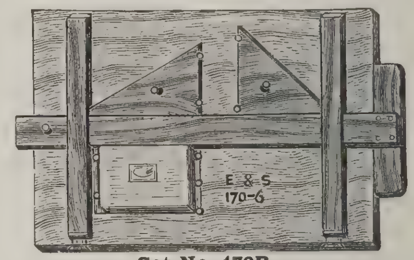
No. 144.



These Boards are made from best seasoned pine, grooved with mahogany battens, brass slots and screws to allow of contraction. One edge inlaid with ebony.

23×16 in., Royal -	**7/-**
28×21 in., Imperial -	**9/-**
32×23 in., Imperial (full)	**12/-**
42×29 in., Double Elephant	**16/-**
54×32 in., Antiquarian	**25/-**

DRAWING SETS.



Set No. 170B.

The "Student's Own" Drawing Set, comprising drawin board (size 23 × 16), 24 in. T-square, 2 large set square 12 drawing pins, and set of instruments in rosewood hood case, comprising 4½ in. brass divider, needle-pointe compass with pen and pencil points, bar, patent penc point, box of leads, slip rule, and pencil holder, **7/6** each

The above Prices include Postage within the United Kingdom.

TRANSPARENT SET SQUARES.

4 in. 60°, 4 in. 45°	**-/5**	each.
6 in. 60°, 5 in. 45°	**-/8**	„
8 in. 60°, 7 in. 45°	**1/2**	„
10 in. 60°, 9 in. 45°	**1/9**	„

Any Size cut to Order.

CLINOGRAPHS.

PEARWOOD CLINOGRAPHS	**1/3**	each.
MAHOGANY Do.	**2/3**	„

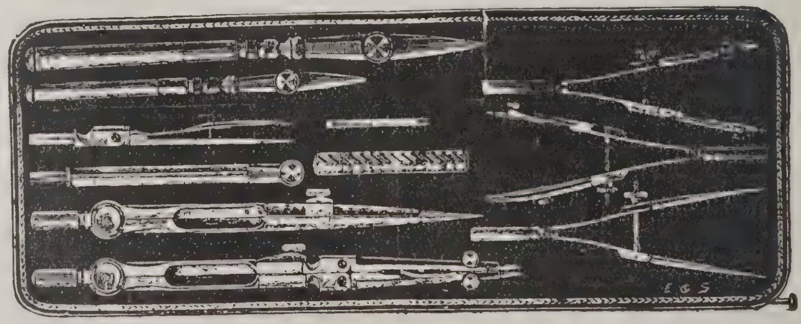
SURVEYORS' RODS.

BUILDERS' RODS, INCHES THROUGHOUT, BLACK OR WHITE	**6/-**	Per pair.
BUILDERS' RODS, SPRING-JOINTED	**7/-**	„

BEST ELECTRUM BOW-HEADED SET.

In Morocco Pocket Case, with Rod Fastening.

Illustration shows one-third of actual size.



Comprising 6 in. bow-headed compass, with double knee-joints, pen and pencil legs, lengthening bar **hair-spring divider**, two ruling pens, set of three spring bows, case of leads and compass keys.

Price 22/6.

All goods supplied by us guaranteed and money will be returned if any article proves unsatisfactory.

Special Quotations given for Quantities. Schools and Technical Institutes supplied.

THE BUILDERS' JOURNAL SUPPLY DEPARTMENT,

6, Great New Street, Fetter Lane, E.C.

THE
BUILDERS' JOURNAL
AND ARCHITECTURAL RECORD.

May 31, 1905. Vol. 21, No. 538.
6, Great New Street, Fetter Lane, E.C.

Summary.

A serious subsidence has been going on at the east end of Winchester Cathedral, which is now 2ft. out of the perpendicular. (This page.)

An exhibition of photographs and drawings of architectural "refinements"—the collection of Mr. W. M. Goodyear, of Brooklyn—is proposed to be held in Edinburgh during August and September next. (Page 308.)

The Registration Bill of the Society of Architects was introduced again in the House of Commons on May 15th. This provides for the creation of a General Council of Architectural Education and Registration, to whom persons desirous of being registered would need to prove that at the date of the passing of the Act they were fellows or associates of the Institute, members of the Society of Architects, professional members of some architectural society affiliated with the R.I.B.A.; persons practising architecture prior to January 1st, 1895, and still so practising; or persons who had served as apprentices, assistants or practitioners in architecture for twelve years in the aggregate after attaining the age of fifteen years. (Page 303.)

Sixty more cottages are proposed to be built on the L.C.C. Wood Green estate at a cost of £13,919. (Page 308.)

In giving judgment in a light and air case last week, Mr. Justice Farwell pointed out that the dominant owner was never entitled to all the light that came through his windows. The question always was, not whether some light had been taken, but whether so much as to cause a nuisance. (Page 306.)

A small house in Paris has been provided with a foundation consisting of an inverted arch of armoured concrete of 34ft. 4ins. internal radius and 19·6ins. thick extending over the whole site. (Page 309.)

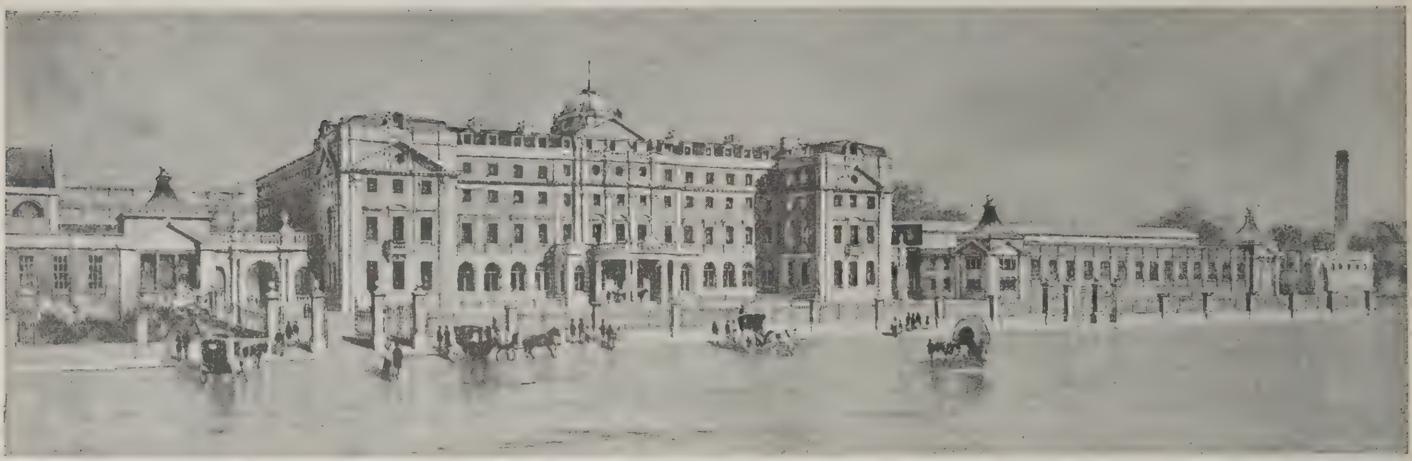
Of the six designs submitted in limited competition for the rebuilding of King's College Hospital at Camberwell, Mr. Edwin T. Hall's is the best plan and Mr. Saxon Snell's the best elevation: the selected design, by Mr. W. A. Pite, suffers from defects respecting light and air. (Page 298.)

An elementary knowledge of chemistry and physics is necessary to a scientific understanding of paints and paintwork. A summary of the principles of these sciences applicable to this subject is given in this issue. (Page 300.)

The L.C.C. Bill for bringing tramways over Blackfriars and Westminster Bridges and along the Embankment has been passed by the Select Committee of the House of Commons. (Page 308.)

Undeveloped Resources. On several occasions we have referred to the wonderful richness of Ireland in minerals, especially granites, building stones and marbles, and have expressed the belief that the development of these resources would confer a great deal of benefit alike on financiers, on purchasers of these materials, and on the poverty-stricken people of Ireland. We have taken every opportunity to draw attention to these resources of Ireland because we consider that much more permanent benefit is likely to be derived from the Government assisting in their development than in spending large sums of money on more or less unprofitable agricultural land. This has been partially recognized, for it will be recollected that we were able to notice in our issue of March 18th, 1903, the opening of an exhibition of Irish minerals and building stones for a period of three months at the Imperial Institute by the Department of Agriculture and Technical Instruction for Ireland. We urged upon the Department the importance of showing the exhibits in a place frequented by architects and builders who could really help the industries, namely, at the Building Trades' Exhibition. This was done, and proved a surprise to many as to the wealth of varieties and the great beauty of Irish marbles and granites. But large orders could not be executed by many of the quarries, which had little or no machinery, and the railway rates and want of transport went against their profitable working; so that they could not compete with foreign and English materials, notwithstanding their unique character, great beauty, superiority and cheap labour. Now we are pleased to chronicle the fact that in one district of Ireland rich in marble and granite a company has been established to work these materials on an adequate scale. This company is the Galway Granite Quarry and Marble Works, Ltd. It has been promoted in a public-spirited way by Colonel A. H. Courtney, C.B., J.P., a local landowner, to acquire and develop the Shantallow Granite Quarry and Miller's Granite and Marble Works at Galway, neither of which had been worked to anything like their full capacity before. Only a small royalty has been reserved by Colonel Courtney, his object being not to make money out of his project but to benefit the district. He has shown us samples of the materials from his quarries. These comprise three varieties of red granite which are very handsome and afford a welcome change from Peterhead. They take a fine polish, are of uniform grain, of delicate mottled pale pink and greenish tint, and as they have plenty of closely aggregated quartz mingled with the various coloured felspars, are very durable. They can be got in very large blocks, free from joints and iron. The marbles consist of the renowned "Irish green" of Connemara—the most beautiful green marble in the world, one of the few greens to resist weather—and a dense black limestone. The former is in two varieties—the rich dark green which hitherto has been found almost impossible to get in any quantity, and the better-known lighter Connemara green. The latter polishes finely and is free from clay, and is therefore eminently suitable for steps and pavements in churches, town halls, &c. The quarries are only about 1¼ miles from the docks, and there is practically unlimited water-power and water-carriage at the very door. Machinery is being put down to polish and work the marble and granite, the best expert advice has been sought, and the cost will compare very favourably with others. The registered offices of the company are 36, College Green, Dublin.

Subsidence at Winchester Cathedral. Within the last week serious reports have been circulated about the stability of Winchester Cathedral, the east end of which has been slowly but surely subsiding. Excavations have been made to ascertain the state of the foundations, which rest on a bed of peaty mould, with a substratum of gravel, and the cathedral authorities, under the advice of their architect, Mr. T. G. Jackson, are endeavouring to check the subsidence at once. It appears that at a depth of about 16ft. there is a stream of water flowing, which may account for the trouble, though it should be pointed out that in the case of St. Paul's, where subsidences on the south side have occurred, the deflection of water-bearing strata by underground tunnelling has been ascribed as the cause. It is generally understood that the east end of Winchester Cathedral was built upon swampy ground, and that the foundations were strengthened by oak piles, which, after the lapse of several centuries, may very possibly be decaying. At any rate, the wall abutting on the Lady Chapel is about 2ft. out of the perpendicular, and a great part of the east end is tilting towards the west exactly to that extent.



ACCEPTED DESIGN FOR THE REBUILDING OF KING'S COLLEGE HOSPITAL AT CAMBERWELL, LONDON, S.E. W. A. PITE, F.R.I.B.A., ARCHITECT

KING'S COLLEGE HOSPITAL COMPETITION.

THE six sets of designs for the new King's College Hospital to be built at Camberwell have been on view since Friday last at Carpenters' Hall. It will be recollected that certain names were put before the Hospital Committee, and as a result the following architects were invited to compete:—Messrs. Edwin T. Hall, W. A. Pite, A. Saxon Snell, Campbell Douglas and A. N. Paterson, William Harvey and J. H. T. Woodd (of Messrs. Woodd & Ainslie).

The Selected Design.

Mr. Pite's design has been placed first by the assessor, Mr. Rowland Plumbe, F.R.I.B.A. We give a perspective and block plan of it herewith. The site has a main frontage to Bessemer Road, and is bordered on one side by Denmark Hill, which causes a fall of about 19ft. from south to north. Mr. Pite, it will be noticed, has grouped his buildings with the administration block in the centre facing Bessemer Road, with the casualty and outpatients' department on one side and the medical school and mortuary on the other, the seven ward blocks being arranged parallel to one another behind, and the isolation block placed at the south-west corner of the site. The administration department provides, on the ground floor of the central block (S), rooms for the resident medical officers and hospital clerks and dressers, with the matron's department on the first floor and servants' bedrooms on the second: the left-hand block (R) comprising nurses' dining-rooms on the ground floor, recreation-rooms on the first floor, and nurses' bedrooms on the second and third floors; the right-hand block (T) comprising sitting-rooms and bedrooms for the resident medical officers on the ground floor and nurses' bedrooms on the floors above; while the central front block (U) provides secretarial and staff rooms on the ground floor, rooms for sisters, matron, &c., on the first, and nurses' bedrooms above. The wards themselves are each 111ft. by 27ft., with a semi-circular private or labour ward, and ward kitchen, &c., opposite, at the entrance, cut off from the rest of the building by a disconnecting corridor. At the opposite end are the usual sanitary annexes.

This plan is carefully-thought-out, but seems to suffer in several respects in regard to light and air. The elevation is rather stale and dull, and the arrangement of the dome and pediment to the administration block is not happy.

The Best Plan.

The best plan in the room is that of design "A" (by Mr. Edwin T. Hall, F.R.I.B.A.). This is very skilfully arranged in every detail, and embodies a very great experience of hospital work. The feature of this plan is that instead of grouping the whole seven ward pavilions side by side at the back of the site, they are arranged alternately north and south of the main corridor, thus securing much better lighting and more air-space around them. The elevations, however, are by no means good, being sadly lacking in proportion, as in the turrets carried up on either side of the pavilions. We understand, too, that the cost of this design is estimated at £400,000; whereas Mr. Pite's works out at £350,000. The administration block is centrally placed facing Bessemer Road, with nurses' home behind, affording pleasant outlooks from the rooms. The eye, ear, throat and skin department and the block for "specials" face Denmark Hill, with the chapel between. Another feature of this plan is the medical school, which is grouped to the right of the administration block and so arranged that students cannot disturb the rest of the hospital.

Mr. Saxon Snell's Design.

So far as general grouping and elevation are concerned, the most pleasing of the designs is that marked (Z), by Mr A. Saxon Snell, F.R.I.B.A. In this the outpatients' department and medical school are kept low on either side of the entrance from Bessemer Road, with casualty and dispensary blocks, chapel and hostel to the left, and medical school, laundry and boiler-house, post-mortem, workshops and isolation block to the right; while the administration building piles up on the higher ground at the rear and forms a fine group. The wards are at the back—three to the left and four to the right of the administration block and nurses' home. Between the outpatients' department and the surgical wards is a block providing ophthalmic wards on the ground floor, a bathing establishment in the basement, and operating rooms on the first floor; and, similarly, on the opposite side of the site is a block of ear and throat wards; while right and left between them are the surgical operating theatre and the medical lecture theatre. The main wards are 109ft. 6ins. by 27ft. The cost of this design is put at £380,000.

Design by Messrs. Douglas and Paterson.

Design "X" is by Messrs. Campbell Douglas and A. N. Paterson. It is accompanied by a large line perspective, presumably done by Mr. Alex. McGibbon. This design, which is estimated to cost £436,079, is somewhat on the lines of Mr. Pite's plan, the administration building occupying a central position facing Bessemer Road, with the outpatients' department on one side and pathological department, post-mortem block, &c., on the other. Most of the ward blocks are behind, though some are brought on to the front side of the main corridor. The medical school faces Denmark Hill.

Designs "B" and "T."

Design "B" has the outpatients' department arranged centrally facing Bessemer Road, with casualty block on one side and resident medical officers' quarters beyond, while on the opposite side are isolation block, laundry, post-mortem and school buildings The ward blocks have an air-space of 86ft. between each (in one case 115ft. 6ins.). Each ward is 116ft. by 27ft. and accommodates twenty-four beds—1,755 cub. ft. of space per bed. The elevation of this design is dignified, and is rendered by a fine black-and-white perspective.

Design "T" has the administration block on the Denmark Hill frontage, with the outpatients' department on one side and the nurses' home on the other. Extending across the site are two long corridors, closed at the further end by the pathological block and mortuary. The medical school, detached, is close to the latter. There are six ward blocks and an isolation block at one side, where also are laundry, boiler-house and workshops. The wards are 101ft. 6ins by 27ft. 9ins.

Reviewing the competition as a whole, it may be said that all the designs exhibit much skill, but that Mr. Hall's is the best plan and Mr. Snell's the best elevation.

"THE TUFTON STREET TATLER."

THE first spasm of "The Tufton Street Tatler or The Purple Patch," issued by the wits of the Architectural Association, is a production of various merit. In part it is laborious humour glibly written, in part it savours of the music-hall "funny-man," and some of it borders on personalities which a discreet editor would avoid; but there are many clever things in its pages, and as the architectural profession is not so delightfully humorous as to be above such aids, we welcome this effort and wish it every success.

Below are some of the best extracts from the first issue:—

THE DAY'S WORK.

I got to the office at half-past ten,
And sat on my stool and sighed;
Poor Jim grew sleek on a pound a week
In this way till he died.

I drew a moulding about a door,
And figured it two by three;
Then feeling weak, I went to seek
A neighbouring A.B.C.

When I came back in the afternoon
That moulding looked too small;
After earnest thought, I felt I ought
To rub out door and all.

Just as I finished, the clock struck five,
And I thought, with a weary sigh,
"It's hard for you to earn your screw
In this way till you die."

Moral.

Do as little as ever you can,
But do it extremely well,
And then, you know, to Heaven you'll go,
Unless you go to H—ll.

He thought he saw an architrave
And eke a pannelled door,
He looked again and saw it was
A ferro-concrete floor.
"These arty men *do* draw," he said,
"As none have drawn before."

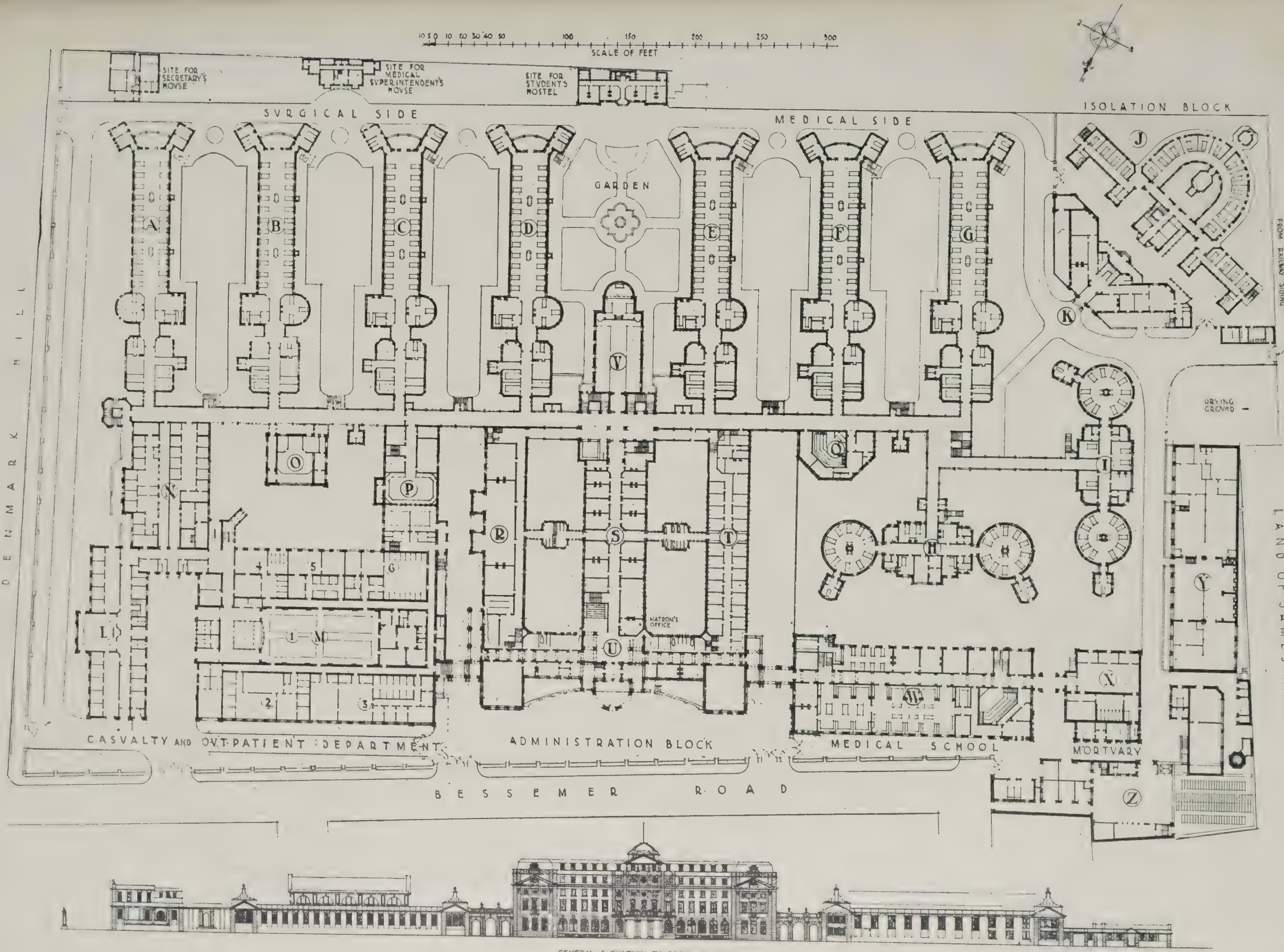
Answers to Correspondents.

W. H. & E. T. H.—Nothing is known about ventilation.

A. M.—Yes, one postcard is quite sufficient both for specification and perspective.

TRY RANCHESTER & LICKARD'S RO-COCOA.—[ADVT.]

The second issue of "The Tufton Street Tatler" will be in September. The price is 6d.



GENERAL ELEVATION TO BESSEMER ROAD

SELECTED DESIGN FOR THE REBUILDING OF KING'S COLLEGE HOSPITAL AT CAMBERWELL, LONDON, S.E. W. A. PITE, F.R.I.B.A., ARCHITECT.

A, B, C, D, E, F, G, ward blocks. H, eye, ear, throat and skin. I, extension. J, isolation. K, administration building for isolation block, and nurses' home. L, casualty. M, outpatients. N, bathing, with electrical section over. O, three operating theatres. P, dispensary with theatres over. Q, medical clinical theatre. R, S, T, U, administration block, with kitchens, stores and servants' living-rooms in basement. V, linen, with future chapel over. W, pathological, medical school buildings and students' club. X, post-mortem. Y, laundry. Z, outbuildings.

HOUSES·AT·WALTON·ON·THAMES· NIVEN·AND·WIGGLESWORTH·ARCHTS

PAINTS AND PAINT-WORK.—III.

(Continued from p. 259, No. 535.)

CHEMISTRY AND PHYSICS.

BEFORE proceeding to a detailed investigation of paints and the conditions to which they are subject we feel it necessary to give a general outline of chemical and physical theory in relation to our particular subject. Though what we say here may not seem to some to be very closely related to the subject we have in hand, nor to go very thoroughly into the chemistry and physics of colour manufacture, it should be explained that this is only intended to be an introduction to what will follow, when the principles here touched on will be elaborated and extended in connection with the exemplary pigments, vehicles, &c.

Modern Science

may be stated to be based upon the dual doctrine of the indestructibility of matter and of energy. Conjointly with this we have the ideas of the convertibility of energy into various kinds, and of matter being composed of elementary substances which can combine with each other.

The sciences included under the heading of physics, we may say, deal with energy, while chemistry deals with the elementary substances and their combination. But seeing that the operations of chemistry both require energy for their action, and develop energy, the connection between the two is so close that no exact division can be made, and we have, perforce, in this article to treat the two branches together. Indeed, it is one of the conceptions of modern science that matter is but a manifestation of energy: which view everything seems to tend to establish.

As the result of experimental work a number of laws or generalisations have been determined which are used as standard instruments of research. They have been tested and put to the proof so often that they seem almost incontrovertible; and their observance enables us to judge with certainty the results of most actions, and to predict with all probability what will be the effect of many new factors. Chemistry is an exact science, and if the circumstances are exactly repeated the same result will always be arrived at. This fact is expressed as the cardinal principle of chemical action—the law of constant and multiple proportions.

The Atomic Theory,

first conceived by Dalton, but considerably modified, has been found a workable hypothesis, and modern chemistry is based upon it. This theory is as follows:—It is assumed that every kind of matter is built up of one or more elementary bodies, which are simple in form and cannot be split up into any others. These elements are found to combine with each other in definite proportions, and it is assumed that every substance is compounded of a number of small atoms (*i.e.*, the smallest particles that can enter into chemical combination). These in different elements are not of the same weight, but bear the same proportion as their combining weights. Thus, 81 parts of zinc oxide (zinc white or Chinese white) is composed of 65 parts of zinc by weight to 16 parts of oxygen, and the theory assumes that in the compound zinc oxide the number of atoms of oxygen is equal to the number of atoms of zinc, but as their proportionate or equivalent combining weights are as 16 and 65, the atom of zinc is assumed to be just over four times as heavy as the oxygen.

Atoms are not considered to exist in their free state, but to be the smallest portions of a body that can enter into a chemical change. In the free state bodies are assumed to exist only as molecules; that is, they are the smallest portions which can exist in that state. Molecules, when in the gaseous state, are almost invariably compounded of two atoms. The atom being the smallest portion of any element which can enter into any combination, the smallest proportionate amount in which it will combine with any other element is taken as its equivalent weight, and in other combinations where the proportion is larger it is assumed that more than one atom is combined with the other constituent or constituents. Some elements will take to themselves one, two, three, up to eight atoms of another, and this power is called valency, atomicity, or quantivalence.

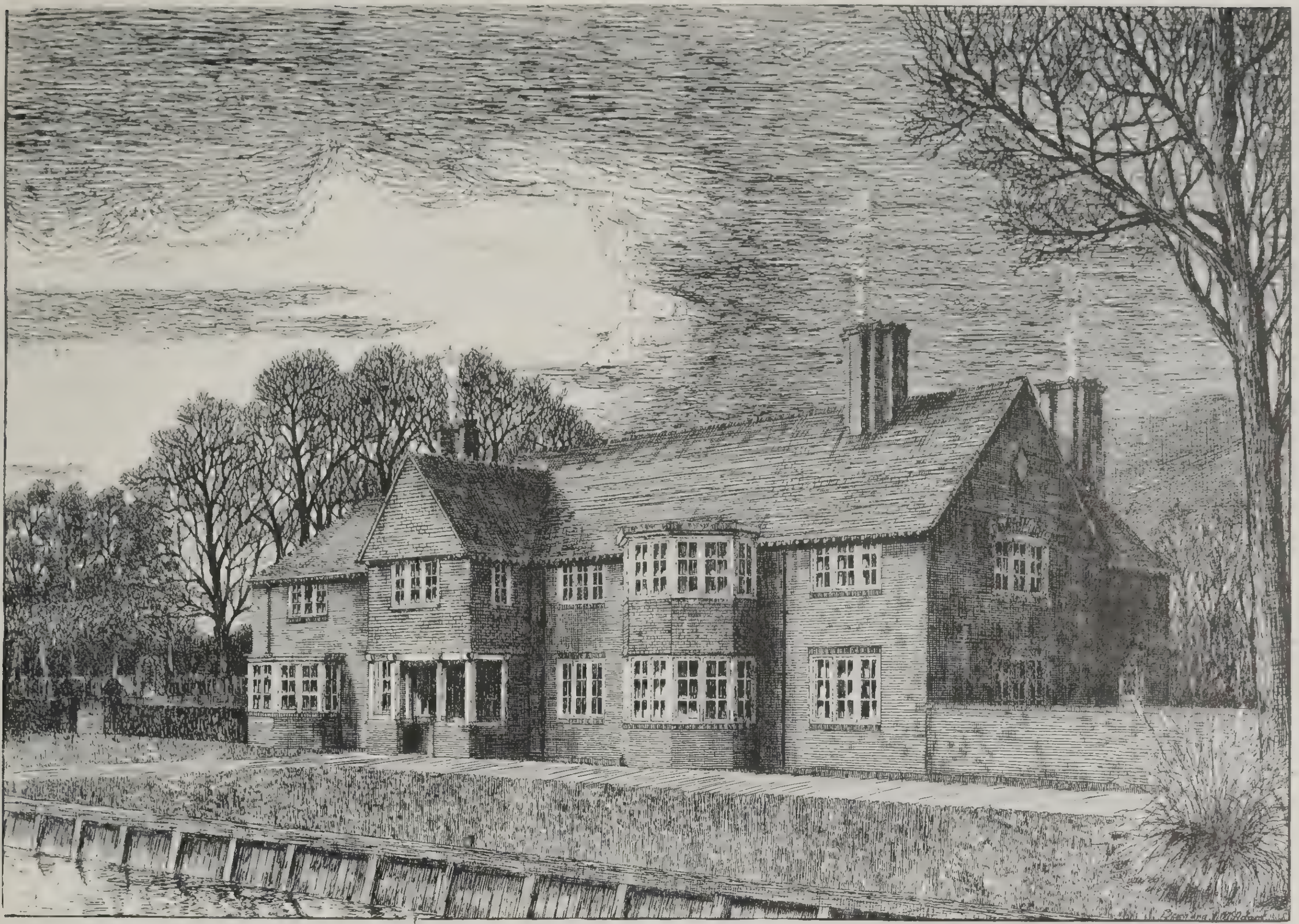
Valency.

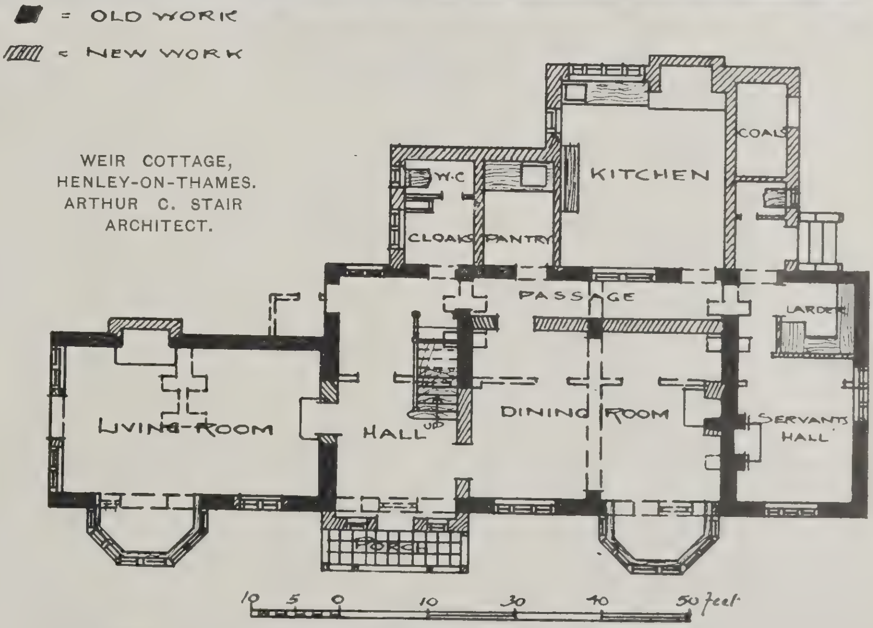
Valency may popularly be compared to the exchangeable value of coins; thus as compared with a farthing a penny is four valued, and as compared with a penny a sixpence is six valued. It is a disputed matter whether the valency is variable or always remains the same, for most of the elements are found to act as though their valency were variable. It seems probable, however, that the valency is invariable, and the apparent variability is due to their being able to satisfy some of their powers for

(*a*) (*b*) (*c*)

COTTAGES AT CAMPDEN, GLOS. C. R. ASHBEE, ARCHITECT.

These cottages are built of Cotswold stone with Cotswold stone slates: (*a*) was built for the Earl of Gainsborough on the ruins of what was once a labourer's cottage; there is a steep fall of 10ft. from back to front, which accounts for the two doors, the lower one to the road being the cellar for coals and storage. (*b*) and (*c*) are for Mr. William Nathon Izod; (*b*) looks out on the High Street; (*c*) shows the back view with its garden.





This house occupies a most important site on the Thames. It formerly consisted of four workmen's cottages, and it has now been converted into a riverside house, the external walls, the principal internal walls (as shown on plan) and the old roof being retained. For the back addition and bays old bricks and tiles have been used to give a uniform appearance. The two principal rooms have square-framed panelling, the dining-room in oak and the living-room in deal painted white. The builders were Messrs. Walden & Cox, of Henley-on-Thames, and the architect was Mr. Arthur C. Stair, of 9, Queen Victoria Street, E.C.

taking up atoms by combining with themselves.

It has been discovered that the quantity of heat an elementary substance will absorb (*i.e.*, its specific heat) is inversely proportionate to its equivalent weight, which is expressed by the law that—the atoms of elementary matter have the same capacity for heat. Again, equal volumes of gases generally contain the same number of molecules when compared at the same temperature and pressure (Avagadro's law); from which it follows that the ratio of the weights of equal volumes of two gases compared at the same temperature and pressure must represent the relative weights of the free molecules of the two bodies. It should be particularly noticed that this gives the molecular weight, not the atomic, though the latter can often be inferred.

Name of Element.	Symbol.	Atomic Weight.
Aluminium - - - - - -	Al^{iv}	27·3
Antimony (Stibium) - - - - -	Sb^{v}	120·0
Arsenic - - - - - -	As^{v}	75·0
Barium - - - - - -	Ba^{ii}	137·0
Bismuth - - - - - -	Bi^{iii}	208·9
Boron - - - - - -	B^{iii}	11·0
Bromine - - - - - -	Br^{i}	80·0
Cadmium - - - - - -	Cd^{ii}	112·0
Calcium - - - - - -	Ca^{ii}	40·0
Carbon - - - - - -	C^{iv}	12·0
Chlorine - - - - - -	Cl^{i}	35·5
Chromium - - - - - -	Cr^{vi}	52·4
Cobalt - - - - - -	Co^{iv}	59·0
Copper (Cuprum) - - - -	Cu^{ii}	63·0
Fluorine - - - - - -	F^{i}	19·0
Gold (Aurum) - - - - -	Au^{iii}	197·2
Hydrogen - - - - - -	H^{i}	1·0
Iron (Ferrum) - - - - -	Fe^{iv}	56·0
Lead (Plumbum) - - - -	Pb^{iv}	207·0
Magnesium - - - - -	Mg^{ii}	24·3
Manganese - - - - -	Mn^{vi}	55·0
Mercury (Hydrargyrum) - - -	Hg^{ii}	200·0
Nickel - - - - - -	Ni^{iv}	59·0
Nitrogen - - - - - -	N^{v}	14·0
Oxygen - - - - - -	O^{ii}	16·0
Phosphorus - - - - -	P^{v}	31·0
Platinum - - - - - -	Pt^{iv}	195·0
Potassium (Kalium) - - - -	K^{i}	39·1
Silicon - - - - - -	Si^{iv}	28·0
Silver (Argentum) - - - -	Ag^{i}	108·0
Sodium (Natrium) - - - -	Na^{i}	23·0
Sulphur - - - - - -	$\mathrm{S}^{iv \text{ or } vi}$	32·0
Tin (Stannum) - - - - -	Sn^{iv}	119·0
Zinc - - - - - - -	Zn	65·0

Atomic Weights.

It is by such methods as these that the atomic weights of elements are determined. Herewith is given a list of elements with which we have to deal, giving their equivalent or atomic weights as compared with hydrogen as the unit. There are a number of others, but they are out of our present province. The list gives the valency or power of combining to its atom one or more monad atoms (that is, those whose powers are unity can only take to each of their atoms one atom of another monad element); this power is shown by the small figures at the right-hand side of the symbols, which last are used as a kind of shorthand sign for each element for the sake of convenience.

A Formula

is a short expression in symbols of the proportion and arrangement of the atoms of the elements in a compound. Thus, ZnO, zinc

NICHOLL'S YARD,
FARNHAM.
DRAWN BY
HAROLD FALKNER.

oxide or zinc white, shows that one atom of zinc (Zn) is combined with one atom of oxygen (O). Again, $Zn(OH)_2$ is the formula for hydroxide of zinc. The small figure $_2$ below the line outside the bracket means that the atoms within the bracket are each doubled, namely, the compound consists of one atom of zinc, two of hydrogen and two of oxygen. The bracket serves to show the arrangement of the atoms in so far that OH is a particular combination of atoms known as a radicle, which enters into the molecule as a distinctive and separate body. If a large figure is placed before a formula, as $2Zn(OH)_2$, it means that each part is repeated, that is, there are two of the molecules of zinc hydroxide; thus there are two atoms of zinc, four of oxygen and four of hydrogen.

We can at this juncture explain the meaning of a chemical equation. If to the zinc oxide is added sulphuric acid, water and zinc sulphate are formed. This is expressed by the following equation:—

$$ZnO + H_2SO_4 = ZnSO_4 + H_2O.$$

Now, what does this express? Zn is the symbol for zinc, O for oxygen, H for hydrogen and S for sulphur. ZnO, of course, is zinc oxide, and as zinc has an atomic weight of 65 and oxygen 16, we see that the value of this compound in the reaction is 81. Similarly, the H_2SO_4, standing for the sulphuric acid, has a value of 98, and the products zinc sulphate, $ZnSO_4$, and water, H_2O, have the values 161 and 18 respectively. This shows us that if 98 ozs. of sulphuric acid are added to 81 ozs. of zinc oxide, 161 ozs. of zinc sulphate and 18 ozs. of water are produced. So that this chemical shorthand expresses not only the qualitative but also the quantitative composition of a compound.

A Chemical Compound,

it should be especially noticed, is not a mere mixture which could be separated by mechanical means, but has undergone an entire change of properties by reason of chemical combination, and the constituents can only be separated again by chemical action.

The elements can be divided roughly into two classes, metals and non-metals. The latter given in the table are arsenic, boron, bromine, carbon, chlorine, fluorine, hydrogen, nitrogen, oxygen, phosphorus, silicon and sulphur. The metals have the characteristic metallic lustre, and conduct heat and electricity. The molecular structure of a metal is entirely different from that of a non-metal.

A common division of chemical compounds is into acids, alkalis and salts. All the acids contain hydrogen, which is displaced by a metal in the formation of salts. The acids containing one atom of replaceable hydrogen are known as monobasic acids; those containing two, three or four, dibasic, tribasic and tetrabasic acids respectively. Generally it may be said monobasic acids are the only members of the class which do not form acid salts.

Liquids in Paints.

Matter appears in three states of aggregation, namely, the gaseous, the liquid and the solid state. The two last we have to deal with in paints.

Molecules have an attractive force for each other, and also a moving force tending to separate them. It is the mutual relation of these forces which determines the molecular state of a body, whether it be solid, liquid or gaseous. Molecular attraction is only exerted at infinitely small distances; it is designated by the terms cohesion, affinity or adhesion Cohesion is the force which unites adjacent molecules of the same kind; it is strongly exerted in solids, less strongly in liquids, and hardly at all in gases. Its strength decreases as the temperature rises because the moving force of the molecules increases. Hence solid bodies become first liquid and then gaseous as they are heated. Chemical affinity or chemical attraction is the force which is exerted between molecules not of the same kind. Adhesion is the molecular attraction exerted between the surfaces of bodies in contact.

Matter in a liquid state has a relatively easy mobility of its particles. The fluidity of a liquid is not perfect, the particles always adhering to each other. This property is called viscosity. Liquids have a characteristic property of dissolving solids to form solutions. The term also applies to the mixture of two liquids.

Specific gravity of substances is usually determined with liquids. The specific gravity is the comparative weight of a unit volume of the body to the weight of the same volume of distilled water at a temperature of 4 degs. C.

Solids in Paints.

We are just as much concerned with matter in the solid state of aggregation in paints as with liquids. An elastic body is one which, when deformed under the application of an external force, will recover its original dimensions when the deforming force has been removed. A plastic body is one which will not.

A characteristic property of solid bodies is crystallization. A crystal may be defined as a homogeneous body in which the different physical properties conduct themselves differently in the different directions radiating from one of its points. Minerals are defined and determined by the study of two properties which they possess, namely, chemical composition and crystalline form. The properties of crystals may be divided under the heads of general (such as density, specific heat, temperature of fusion and chemical composition), and directional (such as cohesion, elasticity, and numerous optical, thermal, electric and magnetic properties, and, as well, the crystalline form). If a mineral has all its directional properties in the same direction, it is said to be amorphous, and when some of them vary with the direction they are said to be crystallized. An amorphous material has no characteristic shape (such as a powder or glass), but every crystallized material has one, a body exhibiting its characteristic shape being called "a crystal." The form of a crystal is supposed to be due to the orderly arrangement of the particles, whereas in solution and in the liquid or gaseous condition the particles are free to move in all directions.

A.A. Camera and Cycling Club: Whitsuntide Excursion to Belgium.—The Architectural Association Camera and Cycling Club have arranged an excursion to Belgium for Whitsuntide, leaving Charing Cross Station on Friday, June 9th, by the 9 p.m. train. Bruges will be the headquarters. All communications should be addressed to Mr. Gilbert H. Lovegrove, 18, Foxgrove Road, Beckenham.

IN PARLIAMENT.

(By Our Press Gallery Representative.)

ON May 15th Mr. Atherley Jones introduced the

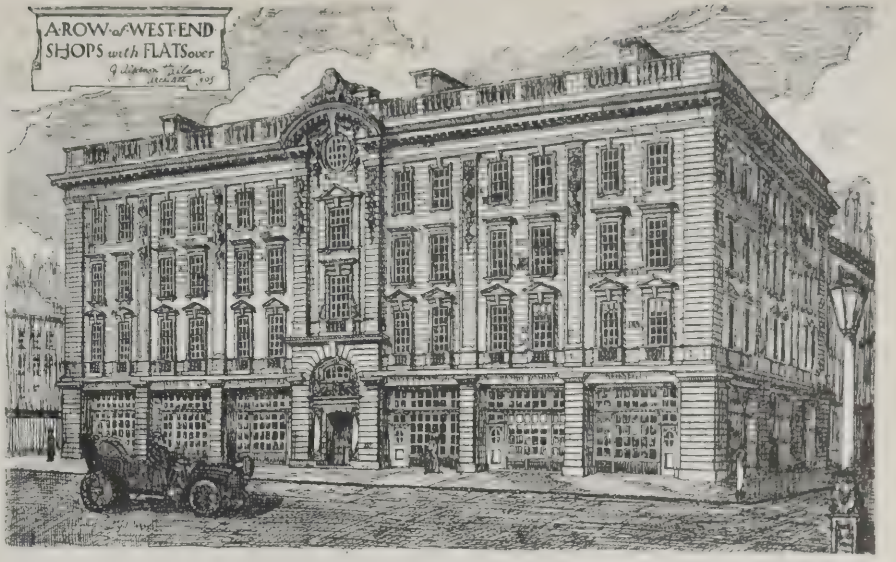
Architects' Registration Bill.

This consists of forty-four clauses, and provides first of all for the creation of a General Council of Architectural Education and Registration of the United Kingdom, with branch councils for England, Scotland and Ireland. Five members of the General Council are to be nominated by the Crown (three of them for England and Wales and one each for Scotland and Ireland). Five architects are to be chosen as members by the Royal Institute of British Architects (three for England and Wales and one each for Scotland and Ireland); one by the Royal Academy of Arts; one by the Royal Institute of the Architects of Ireland; two by the Society of Architects; five by members of provincial societies qualified to register (three for England and Wales and one each for Scotland and Ireland); and nine by registered practitioners (five for England and Wales and two each for Scotland and Ireland). The members shall be chosen and nominated for a period not exceeding five years, and the president shall be elected for a period not exceeding three years.

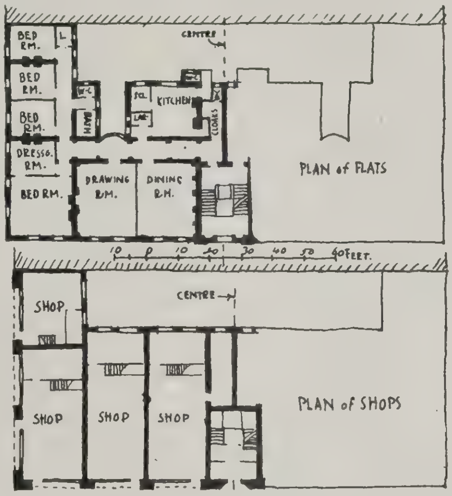
The Privy Council shall appoint the place of the first meeting. An elaborate set of clauses provides the machinery for election. The charters of the Royal Institute of British Architects are to remain in force, and provision is made for the appointment by the General Council and branch councils of a registrar and other officers. Removal of names from the register may be done at the request of the person whose name is to be removed; where a name has been incorrectly or fraudulently entered; where a person registered has, after the passing of the Act, been convicted of an offence which if committed in England would be a misdemeanour or higher offence; or where a person registered is shown to have been guilty after his registration of any conduct infamous in a professional respect A name may be restored by resolution of the General Council.

The Qualified.

Those qualified to be registered are—persons who at the date of the passing of the Act are fellows or associates of the Royal Institute of British Architects, members of the Society of Architects, professional members of any architectural society affiliated with the Royal Institute of British Architects; persons proving to the satisfaction of the General Council that they were practising architecture prior to January 1st, 1895, and are still so practising; or who have served as apprentices, assistants or practitioners in architecture for twelve years in the aggregate after attaining the age of fifteen years. An applicant for admission after the passing of the Act must be over twenty-one years of age, must have served as apprentice for not less than three years with a registered practitioner, and must have passed such examinations as the General Council shall authorize. Registered practitioners shall pay in advance an annual renewal fee of 20s., but there are fees of £5 and £3 payable on registration by different classes of persons qualified at the date of the passing of the Act. Other clauses deal with the penalty on unregistered persons using the title of architect or any title implying that he is registered, the machinery for holding examinations, the registration of branch registers, evidence of qualification, publication of the register and other matters. None but registered persons are to be entitled to recover charges or hold public appointments unless they already hold them. Colonial and foreign practitioners with recognized diplomas are to be allowed to register, their names being kept on a separate list. The Bill is backed by Sir William Coddington, Mr. Wallace and Sir Christopher Furness.



The idea in planning this design was to get as many shops as possible into the main frontage, which is 140ft. As will be seen from the sketch plan, there are six shops on the front and one shop in each side street, the entrance to the flats being in the centre of the main front. The flats are planned to get two suites on each of the three floors, the rooms being of good size and not cramped and ill-lighted; the w.c. and bath having a little disconnecting lobby. The caretaker's quarters are in the roof. The elevations are intended to be in Portland stone, the building to present a homogeneous appearance, with an absence of any of the restless detail usually seen in buildings of this class.



New Government Buildings.

Mr. Cohen asked Lord Balcarres whether there had been any cessation in the external work of the Government buildings at the south end of Parliament Street.

Lord Balcarres said the answer to the first part of the question was in the negative. The scaffolding would probably be ready for removal in about a year's time.

Irish Slates.

Mr. Field asked the Chief Secretary for Ireland whether he was aware that the Commissioners of National Education in Ireland were inviting tenders for the erection of buildings at Glasnevin, and that a supply of Westmoreland slates was specified; and seeing that Irish slates of first-class quality could be supplied at a much lower cost, whether arrangements would be made to allow of competition between Irish and English slates.

Mr. Long replied that the fact was as stated in the first enquiry, but the Commissioners informed him that their architect would be instructed to allow any contractor who so desired to submit an alternative tender for the supply of Irish slates. The Commissioners would further consider the matter when selecting a contractor for the works.

STRENGTH OF CONCRETE STEEL BEAM.

By Henry Adams, M.I.C.E.

TAKING a 12 × 6 concrete beam with $\frac{1}{60}$ of the area in steel reinforcement, 2ins. from the bottom, the strength by the Kahn formula will be found as follows:—

Let E_s = modulus of elasticity of steel = 30,000,000.

E_c = modulus of elasticity of concrete = 2,000,000.

F = ultimate tensile strength of steel = 64,000.

f_t = ultimate tensile strength of concrete = 200.

f_c = ultimate compressive strength of concrete = 3,000.

a = area of metal, b = breadth of beam.

d = depth of beam to centre of reinforcement.

y = distance from centre of reinforcement to neutral axis.

Then $y = \frac{15a + bd^2}{30a + 2bd}$, and moment of resistance $= \left\{\frac{5}{8}(d - y) + y\right\}aF + \frac{f_t b y^2}{3}$. Breadth of beam not less than $\frac{aF}{1800(d - y)}$. Safe load one-fourth or one-fifth. Then $a = \frac{12 \times 6}{60} = 1{\cdot}2$ sq. ins.,

$$y = \frac{15 \times 1{\cdot}2 + 6 \times 10^2}{30 \times 1{\cdot}2 + 2 \times 6 \times 10} = \frac{18 + 600}{36 + 120} = \frac{618}{156} = 3{\cdot}96 \text{ ins.}$$

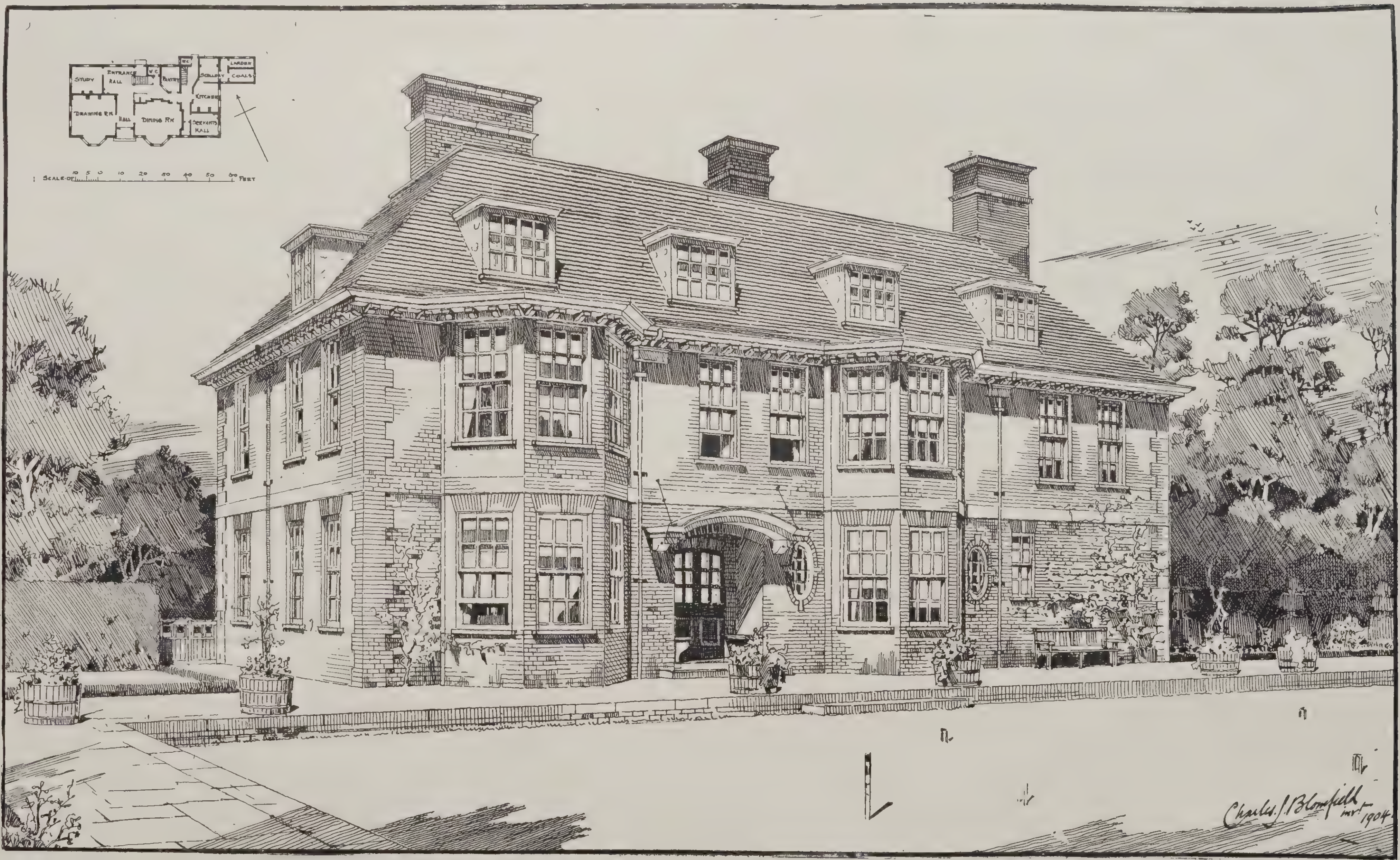
Ultimate moment of resistance $= \left\{\frac{5}{8}(10 - 3{\cdot}96) + 3{\cdot}96\right\}1{\cdot}2 \times 64{,}000 + \frac{200 \times 6 \times 3{\cdot}96^2}{3} = 600{,}320{\cdot}64$. Taking a span of 12ft. and the load W uniformly distributed, the beam being simply supported at the ends, $\frac{WL}{8} = 600{,}320{\cdot}64$, whence

$$W = \frac{600{,}320{\cdot}64 \times 8}{12 \times 12} = 33{,}351 \text{ lbs.} = 300 \text{ cwts.}$$

breaking load. Allowing a factor of safety of 6, the safe load will thus be $\frac{300}{6} = 50$ cwts

By another method, $M = f\frac{I}{y} = 500\,\frac{864}{6} =$ 72,000 lb.-ins. resistance of concrete. For steel $f = 15{,}000$ lbs. per sq. in.; then $15{,}000 \times 1{\cdot}2 \times 4 = 72{,}000$ lb.-ins. Then $\frac{WL}{8} = 72{,}000 + 72{,}000$, whence for 12ft. span $W = \frac{8(72{,}000 + 72{,}000)}{12 \times 12} = 8{,}000$ lbs. $= 71{\cdot}4$ cwts. safe load.

Supplement to
The Builders' Journal and Architectural Record.
Wednesday, May 31st, 1905.



HOUSE AT STANSTED, ESSEX. CHARLES J. BLOMFIELD, F.R.I.B.A., ARCHITECT. *(Royal Academy Exhibition, 1905.)*

This house is now in course of erection for Mr. Harry Chester. The walls are built of Fletton bricks, faced with red bricks from Sible Hedingham. The roof will be covered with red tiles. The accommodation, other than that shown on the ground-floor plan, consists on the first floor of four bedrooms, dressing-room, bathroom, w.c., linen closet, housemaid's closet, and day and night nursery; on the attic floor a schoolroom, four bedrooms, housemaid's closet, w.c. and cisterns. The work is being carried out by Mr. Daniel Robinson, junr., builder, of Stansted.

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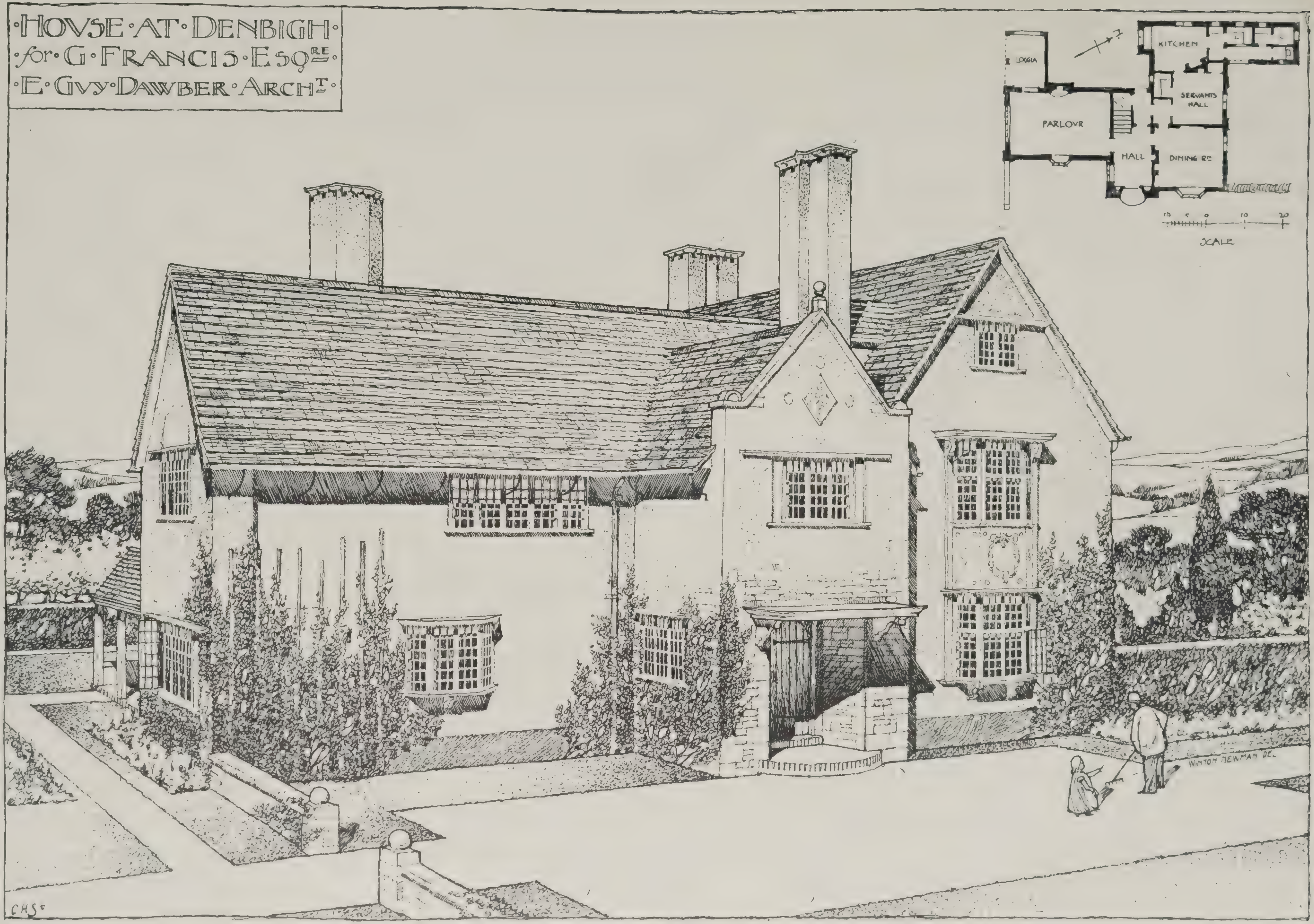


(Royal Academy Exhibition, 1905.)

This house is rough-casted, with green Welsh slates on the roof and old stone in the entrance gable.

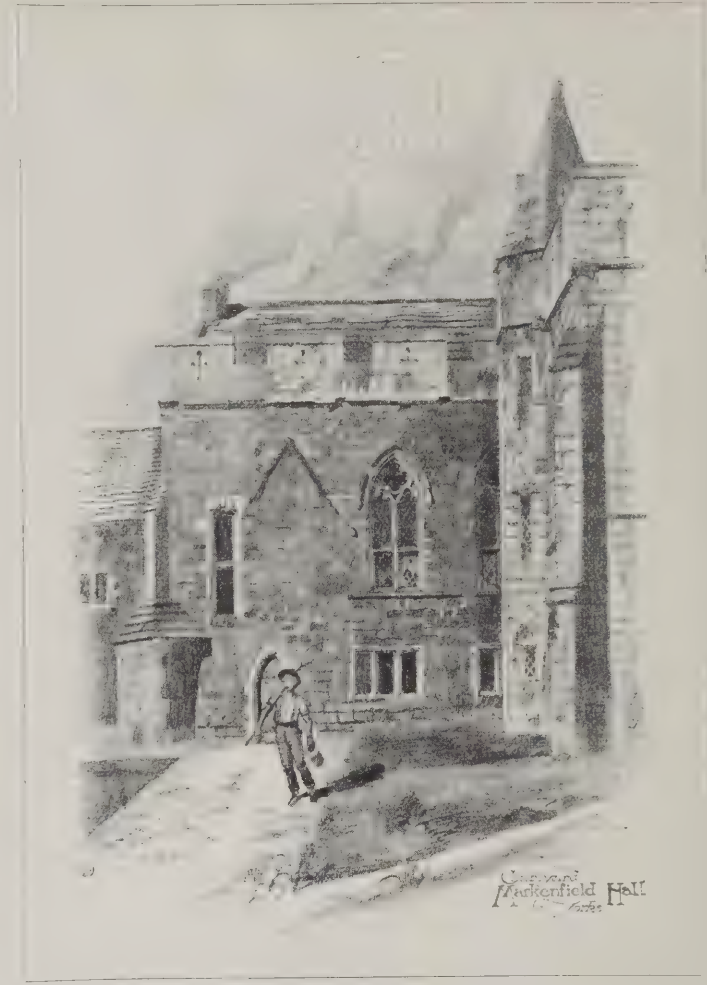
HOME ARTS AND CRAFTS.

THE Home Arts and Industries annual exhibition was opened at the Royal Albert Hall, S.W., by Princess Henry of Battenberg last Wednesday. For the first time the great floor of the Royal Albert Hall had been used for the purpose. 125 classes exhibited, sending work from all parts of the British Islands.

Many of the Home Art classes exhibited several kinds of work; 47 exhibited woodwork (carved for the most part), 9 inlaid woodwork, 24 metal (chiefly repoussé brass and copper, some wrought-iron and a little enamel), 4 pottery, and others lace, embroidery, carpets, silks, &c.

One of the chief features of the exhibition was the stand of the Compton class, promoted by the late G. F. Watts; most of the beautiful terra-cotta and pottery work was to the special designs of Mrs. Watts. Other noteworthy exhibits were by Mr. Frank Rosier, a woodcarver of Sussex, the Birkenhead Della Robbia pottery, and the Ruskin pottery from Birmingham. The aim of the Association is to encourage the practice of handicrafts and revive old ones, more especially in villages and country-places out of touch with the organizations for art and technical instruction enjoyed by large towns. The classes commence usually by purely voluntary effort on the part of those who have the welfare of country dwellers or working people at heart A class may in time develop into an industry doing work sufficiently well to attract regular custom and thus to become self-supporting. It is then known as a "Developed Industry."

The Association assists classes by the loan of designs, models and leaflets of elementary instruction, and gives assistance generally. Architects would do well to seek the aid of these crafts classes in the execution of work to their designs.



DRAWN BY EDWARD WALKER.

Law Cases.

Light and Air Case.—On Friday last in the Chancery Division of the High Court of Justice judgment was given in the important light and air case of *Higgins* v. *Betts*. This concerned the erection of a warehouse and an addition to some premises in Cowcross Street, E.C., which, it was alleged, obstructed the ancient lights of the "Red Lion" public-house opposite. Mr. Justice Farwell, in delivering judgment, said he had taken into account the House of Lords decision in *Colls* v. *Home and Colonial Stores*, and also the recent cases of *Kine* v. *Jolly* and *Ambler* v. *Gordon*. He said that, apart from express contract or grant, the owner of a house had no right to any access of light to the windows over his neighbour's land until he had acquired it by prescription or under the Act. When he had so acquired it, he had a house with an easement of light attached to it, and any substantial interference with his comfortable use and enjoyment of his house, according to the usages of ordinary persons in that locality, was actionable as a nuisance at common law. But the dominant owner was never entitled to all the light that came through his windows. It was not enough to show that some light had been taken, but the question always was whether so much had been taken as to cause a nuisance. With regard to the present case, his Lordship said it was clear that the plaintiff's saloon bar was materially affected, with serious results to the business carried on there, and that the dining-room on the first floor was extremely affected. In that room the plaintiff was left only 32 degs. of light out of a former 67 degs. The pot-house was also affected, and the staircase and scullery on the first floor to some extent. As the result, he found as a fact that there was a substantial privation of light sufficient to render the occupation of the house uncomfortable and to prevent the plaintiff from carrying on his accustomed business as beneficially as he had formerly done. He granted an injunction in the *Yates* v. *Jack* form, with the addition of the words "so as to be a nuisance" and with qualifications counsel had agreed on.

Correspondence.

Stalls.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—In Mr. H. L. North's plan for a mission church near Conway, North Wales, given on p. 287 of your issue for last week, the stalls are shown to the rear (north and south) of the font, and are situated at the extreme west end; and they all face due east. This is entirely at variance with English precedent and tradition. The plan gives plenty of room for them in the chancel, in which a couple of priests' seats and desks are placed, all alone in their glory.

In Germany the Lutheran churches very generally ignore stalls, *i.e.*, in the position where—according to our accepted notions—stalls ought to occur. This is the case, for instance, in the very disappointing new cathedral at Berlin. Further, in the United States I have seen the choirs (mixed) stuck up at the western end—but why such a course should be adopted for a new mission church in this country is not at all clear.

Perhaps Mr. North has good reasons for thrusting the choirmen and singing boys behind everyone else—thus leaving the chancel practically empty. If so, it will be interesting, and possibly instructive, to learn why so unusual a course has been adopted.—Yours truly, HARRY HEMS.

Worm Holes in Oak Dado.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Referring to the query by "Perplexed" on p. 293 of your issue for last week, we beg to point out that "Powellized" wood will effectually resist the attacks of worms and the further encroachment of these pests in wood which is partially decayed. This process should appeal forcibly to owners of valuable furniture, and for wall-panelling and dadoes. We should be pleased to furnish details of the process to any reader on application.—Yours truly,

THE POWELL WOOD-PROCESS SYNDICATE, LTD.
28, FLEET STREET, E.C.

Obituary.

The late Col. Bird died worth £12,000. He bequeathed £200 to the Timber Trades' Benevolent Society.

Mr. John Tweedale, F.R.I.B.A., for twenty-six years a partner in the firm of Smith & Tweedale, architects, of Leeds, died recently in his fifty-second year.

Mr. William Drew, head of the firm of William Drew & Sons, architects, of Swindon, died on May 15th, aged 67. He did a considerable amount of school work, and was the architect of the Clarence Street Schools, Swindon.

Mr. W. W. Freeman, a well-known Chester builder and contractor, died recently, aged 63. He was associated with the building of Chester Town Hall, and when a portion of the building was destroyed by fire a few years ago Mr. Freeman restored it. He also built the Chester isolation hospital and the public baths.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

An Arbitration Case.

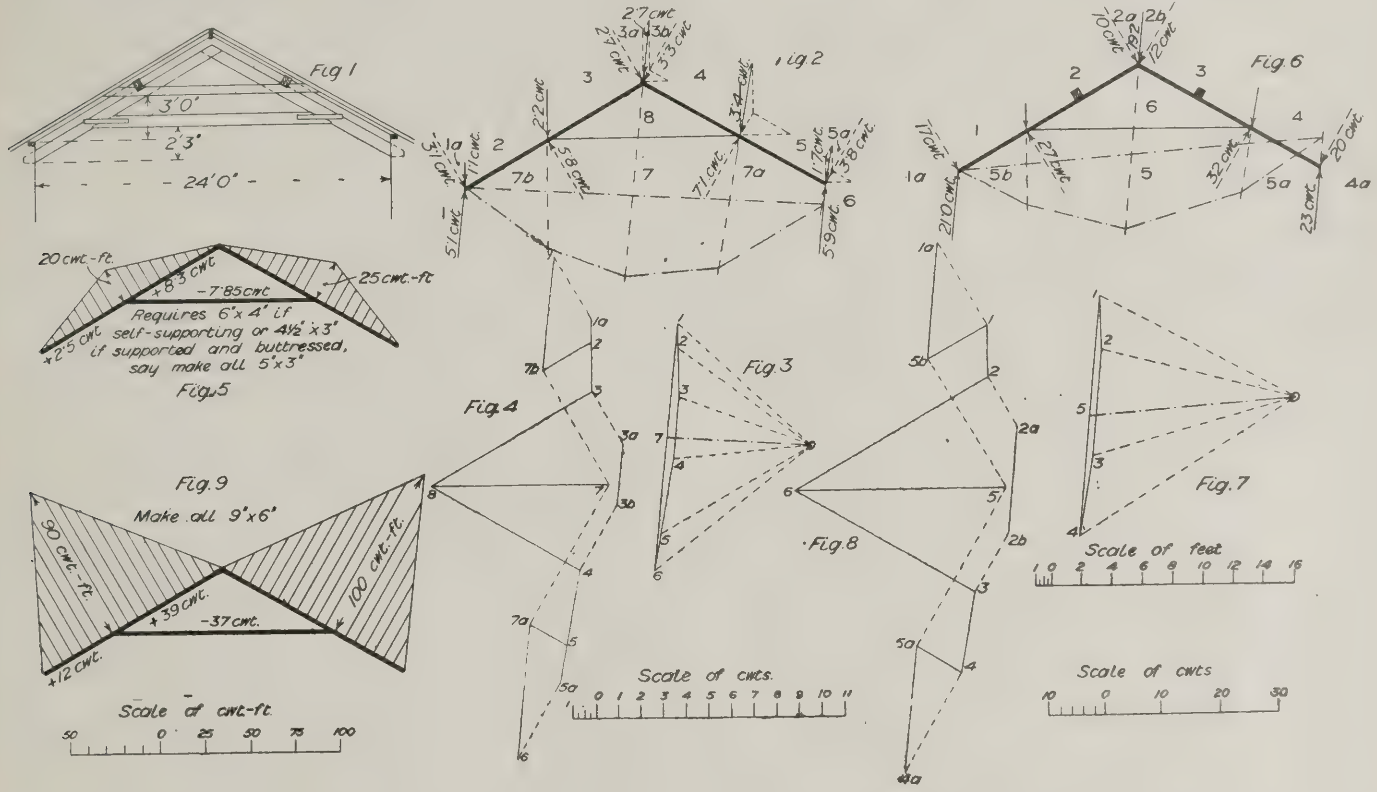
X. writes: "I have lately been connected with an arbitration case which is proceeding in Scotland. Two points have arisen upon which I am greatly in doubt. What I want to know is how far the production of private letters can be insisted on by the arbiter, and also whether 'provisions' in a contract are to be treated as extras or not when measuring up. The facts of the case are briefly these: – The building owner (an electricity company) is being sued by a builder for the amount of a contract and extras. A chimney stalk erected (partially) had to be pulled down by the building owner and rebuilt by the builder. The resident engineer for the building owner was named in the contract to act as clerk of works to the architect, but he also of course at times practically acted as client to the architect A call was made for the letters from the clerk of works to the architect. This was resisted by the building owner because most of the letters are between the resident engineer and the architect, and practically amount to letters between client and architect. Are not these privileged? They certainly contain a lot of private information between the client and architect, and are not letters that would pass between an architect and clerk of works. The call was also resisted because of alleged libels on the builder in the letters. However, the arbiter would not recognize this, and said he would edit the letters to avoid any libel action. Can the arbiter force production? Also, many extras were done without written order. The building owner is resisting these, hoping to save at least some of the costs of the arbitration. The contract is a lump-sum contract. The quantities are part of the contract."

The questions raised by this enquiry are exceptionally complicated, especially as the facts as given are not full enough to permit of a confident opinion being expressed. With regard, firstly, to the correspondence which passed between the clerk of works and the building owner, I think that this should be produced. If the building owner refuses, then a *subpœna duces tecum* should issue against the person in whose custody the correspondence is (see Arbitration Act, 1889, section 18). If the clerk of works has been so negligent as to mix up his correspondence, as is suggested, he and his employer must take the consequences of this negligence. But of course if no letter passed between the clerk of works (*qua* clerk of works) and building owner there is nothing to produce. As it was expressly agreed that "extras were to have written orders," there is nothing due, strictly speaking, for any extras not so ordered. As to the "provisions," I do not quite appreciate the exact meaning of this term, but if the building owner provides for a payment of £30 6s. 7d. for work which has been done it is certainly due to the builder, although the difference between £30 6s. 7d. and £50 4s. 9d. appears to be an "extra" and so not recoverable. At the same time the clause for £50 for contingencies might include extras (not ordered in writing) up to that figure: it depends on the wording of the clause. Let the intention of the parties as expressed or implied by custom be your guide as far as possible. As to cases, I might refer you to Mew's "Digest of Case Law" under the headings of Building Contracts and Arbitration, &c. S. P. J. MERLIN.

Scantlings for Collar-Beam Roof.

WIMBLEDON. — COLLAR writes: "I am unable to find in the text-books the proper method of calculating the scantlings for a collar-beam or 'A' roof principal. Please give the working-out of an example – say 24ft. span, pitch 30 degs., with covering of slate, timber northern pine, trusses 10ft. centre to centre."

The roof shown, of which Fig. 1 is an outline, is a rather peculiar double-truss, compounded of two separate collar-beam trusses – one composed of the pair of common rafters and ceiling joist, and the other of the principal rafters and collar. The dead load on the former trusses may be taken at 28lbs. per ft. super. acting vertically, and the wind force 28lbs. per ft. super. acting horizontally; and assuming the rafters to be 15ins. centre to centre, and none of the load transmitted to the purlins, the frame diagram will be as Fig. 2, reaction diagram as Fig. 3 and the stress diagram as Fig. 4. The maximum stresses and scantlings would then be as marked on Fig. 5. Assuming that the purlins transmit half the load to the lower trusses, and that the walls are not buttressed, the frame diagram will be as Fig. 6, reaction diagram as Fig. 7, the stress diagram Fig. 8, the maximum stresses and scantling as Fig. 9. The details of the method of working were given in "Building World," Nos. 486 and 496 (Cassell & Co., 3d.). HENRY ADAMS.



COLLAR-BEAM ROOF.

Buildings to Measure near Ipswich.

IPSWICH. — STUDENT writes: "Are there any buildings suitable to measure for the R.I.B.A. intermediate examination in the neighbourhood of Ipswich?"

Perpendicular churches at Hadleigh, Boxford, East Bergholt, Stratford St. Mary and Letheringham should furnish you with ample work for the R.I.B.A. intermediate examination. L. G. R.

Cycling Tours.

DARLASTON. — E. G. D. writes: "Which is the best cycling route (architecturally) and the buildings of interest thereon: (*a*) Cirencester to Wells *via* Bath; (*b*) Wells to Salisbury; (*c*) Chichester to Canterbury?"

Cirencester to Wells via Bath. — Leaving Cirencester, proceed along Akeman Street to Marshfield (church) and Cold Ashton (church) to Bath, where Prior Park, the work of John Wood, should be visited. Between Bath and Wells there is nothing of any architectural interest, but Glastonbury Abbey, a few miles south of Wells, is a good example of a Cistercian monastery, and if a sketching permit is required it should be obtained in advance. *Wells to Salisbury.* — From Wells take the road through Shepton Mallet (church) to Frome (church); then branch off to Longleaf Park, where a fine Jacobean residence is to be seen; then on to Warminster (church). From here follow the railway to Salisbury, passing through the following places, all of which contain interesting churches — Heytesbury, Codford St. Peter, Fisherton de la Mere, Stapleford, South Newton. Wilton House deserves notice; it is near the main road. *Chichester to Canterbury.*—There are many routes that might be taken through Sussex, but perhaps the most direct is through Petworth (church), Billinghurst (church), Horsham (church), East Grinstead, Penhurst, Chiddingstone (church), Hadlow Castle, Yalding (church), Maidstone (church), Lydd (church), Lenham (church), Chilham, Chantham (church), Canterbury. L. G. R.

Reductions in Brickwork.

Oldham.—Zaandam writes: "A specification states that '*all* brickwork, including hollows, has been reduced to one brick (9ins.) thick, unless otherwise stated.' Would this apply to the facing bricks? Bill sent."

The "hollows" referred to are presumably "openings" such as are taken in the "Northern" system of measuring. The description as to measurement of brickwork leaves the "facing" a doubtful item both as regards the facing itself and the hollows. Only the person preparing the bill could answer your question definitely.

W. E. D.

OUR PLATES.

SOLOM'S COURT, Surrey, is built of grey bricks, rough-cast, and tiled roof. Particulars of the houses at Stansted and Denbigh are given under the illustrations.

Competitions.

Worthing Public Library and School.—The awards in this competition are as follows:—1st, Mr. H. A. Crouch; 2nd, Messrs. Lanchester & Rickards; 3rd, Messrs. S. B. Russell & T. Edwin Cooper—all of London.

Radcliffe Public Free Library, Manchester.—For this building, which is to be erected in Stand Lane, forty-eight sets of drawings have been received from architects in open competition. The committee have appointed Mr. G. H. Willoughby, F.R.I.B.A., of Manchester, to act as assessor.

Keystones.

Four large new Spinning Mills are to be built at Manchester.

New Washhouses for Dundee are to be erected in Miller's Wynd at a cost of between £6,000 and £7,000.

Wooler Parish Church, Newcastle-on-Tyne, is proposed to be re-modelled from designs by Mr. C. R. Baker King, A.R.I.B.A., of London.

The new Public Library at King's Lynn, opened recently by Mr. Andrew Carnegie, was designed by Herbert J. Green, architect and diocesan surveyor, of Norwich, King's Lynn and Lowestoft.

A new Wesleyan Chapel and Schools at Leeds is being erected in Dewsbury Road, at a total estimated cost of £10,500, from designs by Messrs. Danby & Simpson, architects, of Leeds. The chief contractors are Messrs. W. H. Dews & Co. and Messrs. W. Airey & Son.

Architectural Association of Ireland.—The last general meeting of the session was held on May 23rd. Mr. H. Allberry, A.R.I.B.A., was elected president for the ensuing year, and Messrs. F. Hayes and G. F. Beckett were elected vice-presidents. Committee: Messrs. C. H. Ashworth, F. G. Hicks, J. H. Webb, A. G. C. Millar, C. H. Mitchell, G. P. Sheridan, R. M. Butler, C. J. M'Carthy and J. Holloway. Mr. J. H. Webb, the retiring president, delivered his valedictory address, in which the growth of the Association and the increasing enthusiasm of the members were referred to.

The new Secretary of the Surveyors' Institution is Mr. Alexander Goddard, who succeeds Mr. Julian C. Rogers, retired.

Tribunal of Appeal, L.B.A.—Each member of this tribunal receives three guineas for the first hour of every case and two guineas for every subsequent hour at each day's sitting.

The Rule was too Short.—An Irish bricklayer who was told to measure a length of foundation said, "Altogither 'twas as long as me rule, me arm an' two bricks."

"Furniture Styles."—A second edition of this book, by Mr. Herbert E. Binstead, editor of the "Furniture Record," is to be issued by Mr. A. H. Botwright, 14, City Road, E.C., price 5s.

The North British Station Hotel, Glasgow, was opened last Thursday under the railway company's own management. The building has been reconstructed under the direction of Messrs. Baird & Thomson, architects, of Glasgow.

Hampton Court Palace.—For the convenience of the public the Office of Works have had tablets erected giving the names of the various courts at Hampton Court Palace, and at the east and west fronts large framed coloured plans of the building and grounds are displayed.

New Station at Tilbury.—An embankment 100ft. long and 45ft. wide is to be constructed at Tilbury Pier, and a triangular stage on piles at the lower side of the embankment. This is part of an enormous scheme for the improvement of the station and docks. The scheme will cost £250,000, and will take three years to complete.

Lightning Conductors.—A paper on "Modern Lightning Conductors" was read before the Society of Arts last week by Mr. Killingworth Hedges, M.I.C.E., hon. secretary of the Lightning Research Committee. It is printed in full, with illustrations, in the Journal of the Society for May 26th. Many of the recommendations made have already been noted in our columns in connection with the recent report of the Lightning Research Committee, such as the use of a tubular earth and the advantages of iron conductors.

A Poorhouse at Omoa for the parishes of Cambusnethan, Bothwell and Shotts, Lanarkshire, has been erected from designs by Mr. Alexander Cullen, F.R.I.B.A. There are ten blocks of buildings, providing accommodation for 203 inmates under the following classification:—Receiving or probationary block, 10; four ordinary pavilions, two storeys in height, divided into day rooms and dormitories for 70 males, 48 females and 24 children; hospital block, 24 males and 18 females; and a ward of five beds for maternity cases—this block also providing accommodation for nurses and the doctor. The outer walls are of stone, lined with brick, with a space between. The cost of the whole undertaking will be about £175 per bed.

Sixty More Cottages on the L.C.C. Wood Green Estate are proposed to be built at a cost of £13,919. Tenders have been invited, and the prices obtained are much lower than any before presented to the Council, namely, £228 for a first-class cottage, or £235 for each corner cottage; second-class cottage, £183; and third class cottage, £153 10s. "On the lines now suggested," says the Housing of the Working Classes Committee, "we feel sure that the Council will be safe in proceeding with further blocks of cottages, whereas to allow the estate to remain undeveloped because of a few initial difficulties would be impolitic and would delay the return for the capital outlay incurred, which can only be realized by proceeding with reasonable care to carry out a well-matured scheme of development."

A new Post-office at Crewe has been erected at a cost of £10,000.

Change of Address.—Mr. J. Peebles, quantity surveyor, has removed from 28, John Street to 7, Southampton Street, Bloomsbury Square, W.C.

A Branch Library is to be erected in the Lea Bridge Road by the Leyton Urban District Council from designs by Mr. William Jacques, of 2, Fen Court, Fenchurch Street, E.C.

A part of the Gothic Church of All Hallows in the Wall is now exposed in New Broad Street, where a row of nine eighteenth-century houses is being demolished to make way for new offices.

Royal Exchange Fresco by Mr. Yeames, R.A.—The fresco panel by Mr. Yeames, R.A., in the Royal Exchange, depicting the foundation of St. Paul's School by Dean Colet, was unveiled yesterday.

The new Church of All Saints, Burton-on-Trent, built by Mr. William Bass at a cost of nearly £30,000, was consecrated last week. It is designed in the Late Decorated style and has a tower 120ft. high.

A new Town Hall at Sutton Coldfield is being erected from designs by Mr. Arthur R. Mayston, of London, at an estimated cost of £10,000. The builder is Mr. T. Elvins, of Birmingham. The foundation-stone was laid last week.

The new Middlesex County Asylum which will shortly be opened at St. Albans will have cost £500,000. The estimated cost per bed, without equipment, was £316, but this has been much exceeded. Accommodation is provided (on the Scotch system) for 1,150 patients in pavilions. Of this number there will be 100 paying patients. An unusual feature is a large entertainment hall. The site cost £40,000, and the Midland Railway Co. are constructing a station adjoining it. The contract price for the buildings was £276,375.

Tramways over the Bridges.—The London County Council's Bill proposing to bring tramways over Blackfriars and Westminster Bridges and along the Embankment has at last been approved by the Select Committee of the House of Commons, who have decided that the widening of Blackfriars Bridge is imperative. They have authorized the construction of a subway from the Strand end of Waterloo Bridge to join the subway at Aldwych, but declined to sanction a tramway connection between the Embankment and the shallow tramway under Kingsway. With regard to the widening of Blackfriars Bridge, it is roughly estimated that this will cost about £40,000.

Architectural Refinements.—The exhibition in Rome of drawings and photographs of architectural "refinements," part of the research work of Mr. W. M. Goodyear, of Brooklyn, suggested to the Edinburgh Architectural Association the idea of securing the loan of the exhibits, and the Association has now not only succeeded in obtaining these, but also the whole extensive collection of the trustees of the Brooklyn Institute of Arts and Sciences, to which Mr. Goodyear proposes to add many valuable drawings which are his own property. A complete representation of the work so far achieved would thus be obtained. The exhibition is proposed to be held in Edinburgh during August and September next. As, however, the expenses of freight, insurance, &c., are greater than the Association can meet alone, an appeal is made to those interested in architecture, archæology and education to assist in raising a fund of about £200. Cheques may be made payable to Mr. Colin B. Cownie, hon. secretary of the Association, 17, York Place, Edinburgh.

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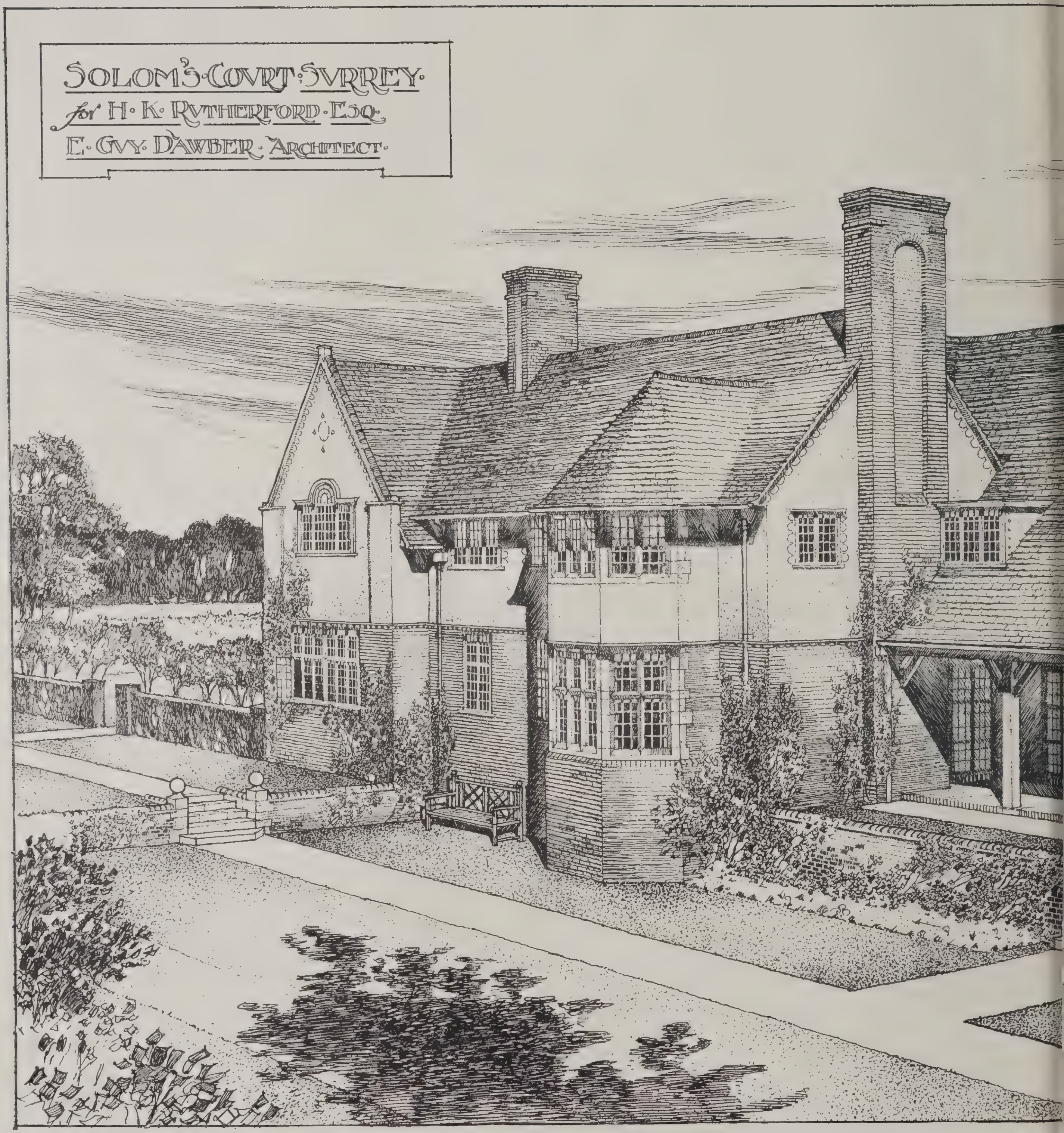
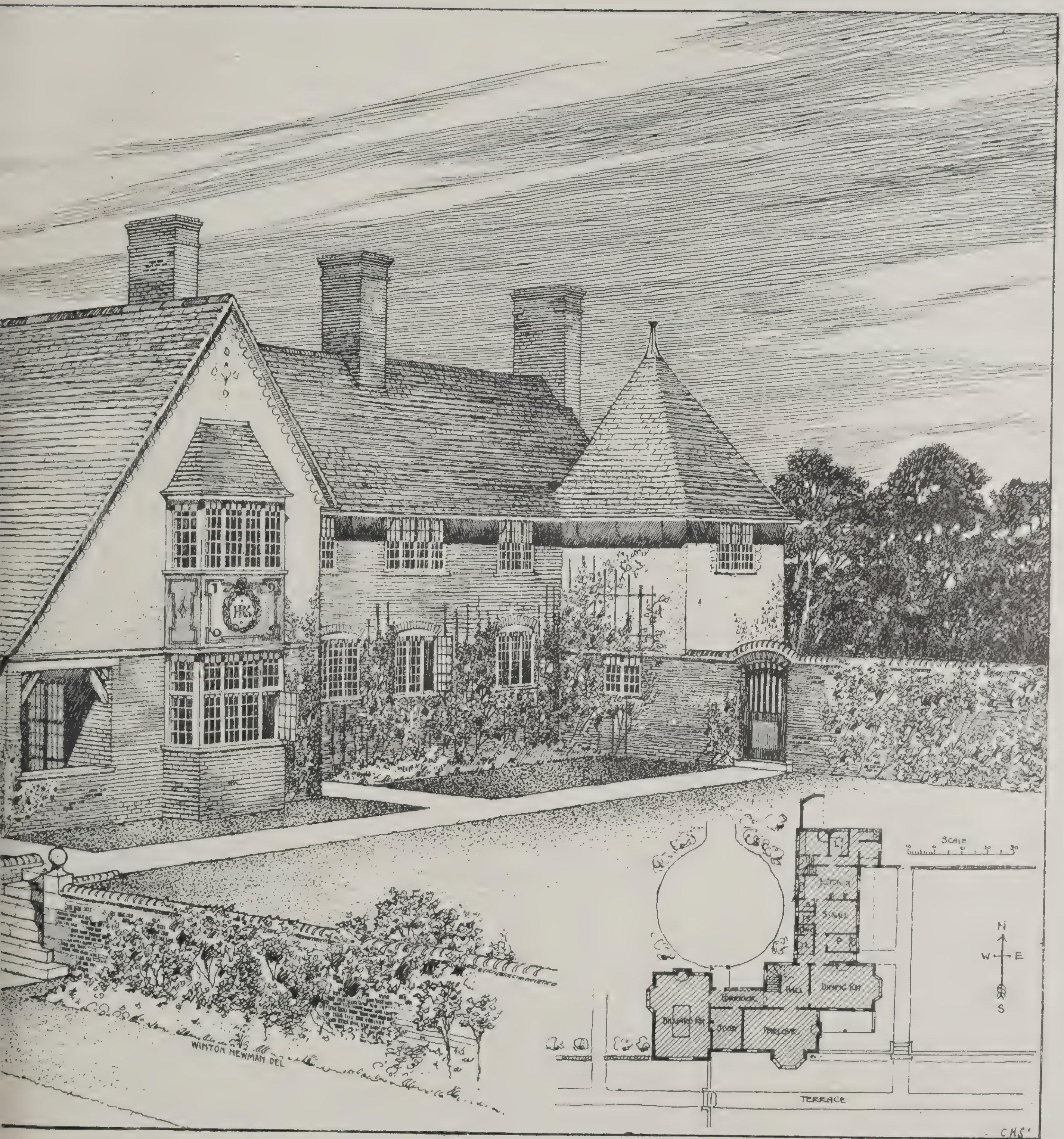
Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, May 31st, 1905.

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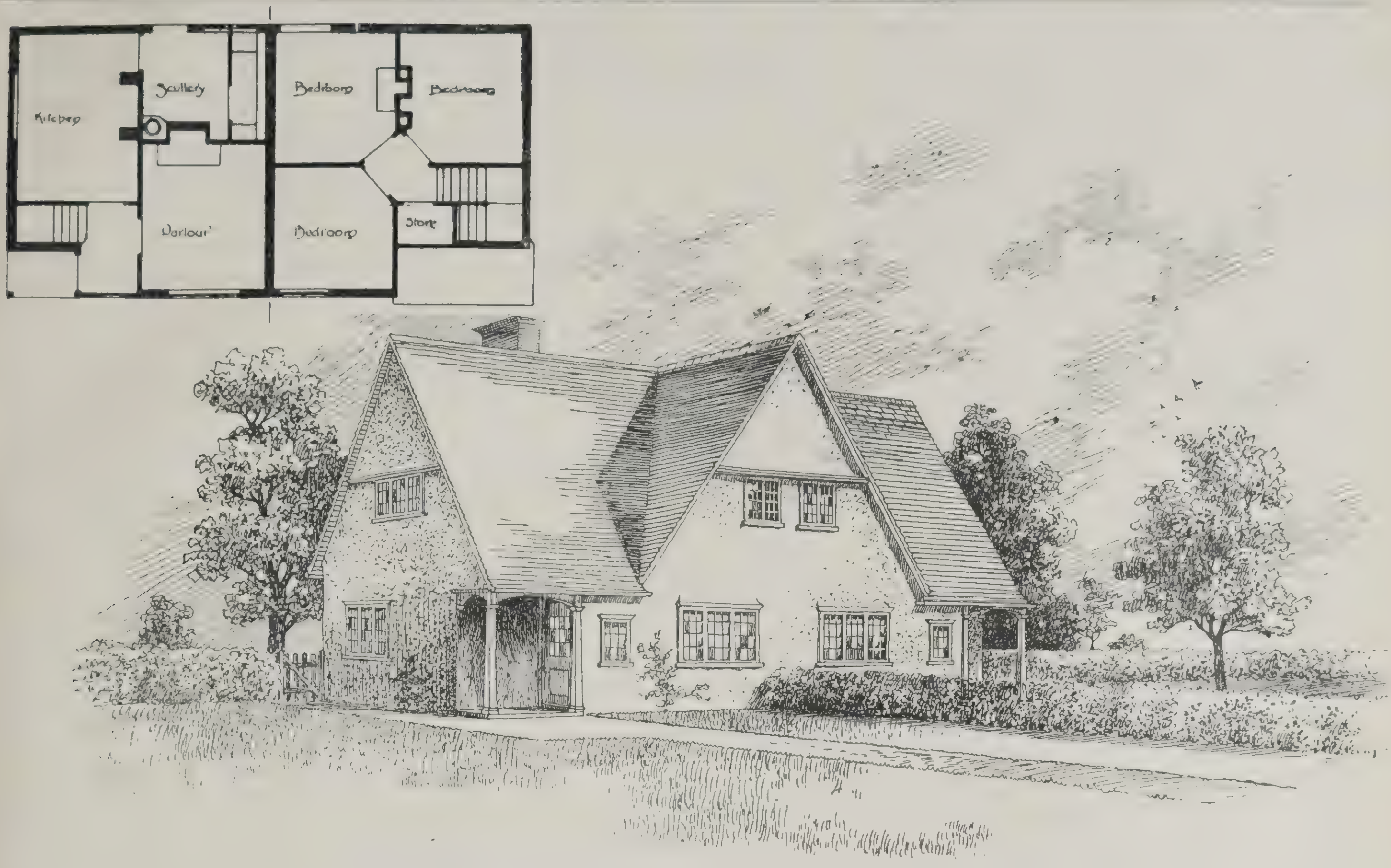

DESIGN FOR £150 COTTAGES.

Views and Reviews.

A Directory for Builders and Architects.

Architects, builders and others will find this directory very useful, for it gives a full list of contractors for waterworks, gasworks, roads, drainage works and contractors' plant and materials, as well as lists of architects, builders, surveyors and engineers throughout the Kingdom, and, at the end, reports of important legal cases relating to contractors' work, Bills in Parliament, works under construction &c. The present edition is the twelfth. It has been thoroughly revised and brought up-to-date, and is therefore a very handy book of reference, but it is not a very cheap book at 15s.

"The Directory of Contractors and Public Works Annual, 1905," edited and compiled by William Biggar. London: "The Contractors' Chronicle," 13, Victoria Street, S.W., price 15s.

The Country Gentlemen's Estate Book for 1905.

In this edition there are more articles than hitherto, and several of them are of the greatest interest to architects and builders, such as "The Rural Housing Question," by Mr. H. Lemmoin-Cannon; "Cheap Country Cottages," by Mr. Charles Carter; "The Small Country House," by Mr. Alfred H. Hart, F.R.I.B.A.; and "The Common Brick," by Mr. S. G. N. Mann. A number of illustrations of cottages, with plans, are given in the volume. In his article on the manufacture of bricks Mr. Mann says that, taking the rental of the field at 6d. per 1,000 bricks turned out, combined with a royalty of 2s. 6d. per 1,000 sold, and the cost of moulding at 5s. per 1,000, the actual cost is usually below 20s. per 1,000: while the cost of machinery (clay and chalk wash-mills and pug-mill) and tools for a yard, with one moulding stool, may be taken at £80.

The accompanying design for £150 cottages illustrates Mr. Hotchkiss's excellent, though short, article on the subject. One of its features is the very steep roof, which saves walls and so reduces cost. The sizes of the rooms would be:—Kitchen, 14ft. by 10ft.; parlour, 12ft. by 10ft.; scullery, 9ft. by 7ft.; larder, 9ft. by 3ft.; bedrooms, 10ft. by 11ft., 10ft. by 10ft. and 9ft. by 11ft. Mr. Hotchkiss says that these cottages have actually been built for £151 each, including fences, drainage, water-supply and carting. They were passed by a rather careful district council, were finished in a first-class manner, the bricks cost more than 30s. per 1,000, and the cottages are dry and comfortable. A detailed cost of labour and materials in building these cottages is given, which is very useful and suggestive.

The book is excellently produced and full of useful information.

"The Country Gentlemen's Estate Book, 1905," edited and compiled by W. Broomhall. London: The Country Gentlemen's Association, Ltd., 2, Waterloo Place, S.W., price 10s. 6d.

Builders' Notes.

Sunderland Building Trade.—The Sunderland operative stonemasons have agreed to accept a reduction of ½d. per hour, with a working day of 8½ hours instead of eight hours.

Armoured Concrete Foundations.—In consequence of the treacherous nature of the clay soil, a small house recently erected from the designs of M. Cappé in Paris has been provided with a foundation consisting of an inverted arch of armoured concrete having an internal radius of 34ft. 4ins., being 19·6ins. thick, and extending over the whole length of the site, which is 61ft. 3ins., with a span of 26ft. 8ins. The ground was carefully excavated to the form of the extrados of the arch, which was then carried out in concrete of the requisite thickness, with abutments at each side, in which longitudinal flat-iron bars 1½ins. by ⅝in. were anchored, with occasional upright anchor bars. The internal space in the hollow of the arch was then filled with damp river sand, well rammed in shallow layers and finished with a perfectly level surface at the springing line of the arch. On this a layer of concrete 3·93ins. thick was laid with bars of hoop-iron embedded at intervals, strained across and hooked over the anchor bars in the abutments, so as to form a continuous tie, and to counteract any tendency in the concrete arch to spread. Full details of the construction are given in the "Nouvelles Annales de la Construction" for May.

A Scottish Quarry Combine.—It is understood that a combine of different quarry-owning firms has taken place under the title of The Lothians Quarry Co. The combine includes twelve quarries in West and Mid-Lothian, and it is expected that prices will have a firmer tendency. The Pardovan quarry, near Linlithgow, which was recently shut down, has been taken on lease by an Edinburgh company of quarry-masters.

Hopton Wood Stone.—The old-established businesses of Killer Brothers, Ltd., and the Hopton Wood Stone Co., Ltd., have been amalgamated, and they will in future be carried on as the Hopton Wood Stone Firms, Ltd. Messrs. J. Hodson & Son, Ltd., of Nottingham, who have acted as sole agents for the first-named firm for some years past, will continue as agents for the combined businesses. They have in course of preparation a new illustrated booklet containing special information about Hopton Wood stone, and they will be pleased to send a copy on application.

Bricks v. Stone.—The master-masons in Glasgow and Edinburgh are very much exercised over the recent decision of the Glasgow Corporation to rebuild the Royal Infirmary with terra cotta blocks instead of stone. It is stated by the Corporation officials that in the construction of the Dennistown and Bridgeton new libraries, although the work is not yet completed, the stone is showing signs of deterioration, and instructions have been given the contractor to appy Zerelemy liquid to the stone as a preservative. It is claimed also that brick-built hospitals are not so damp as stone, and are in other ways better suited for the object for which they were designed.

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
June 1	Pontefract—Completion of Cottage Homes	Guardians	Garside & Pennington, Pontefract.
,, 1	Belfast—School	——	W. D. R. Taggart, Scottish Provident Building, Belfast.
,, 1	Dorchester—Schoolroom	——	J. Feacey, South Walks, Dorchester.
,, 1	Pontardulais, Wales—Institute	——	W. B. Rees, 3 Dumfries Place, Cardiff.
,, 1	Sheffield—School	Education Committee	W. J. Hale, 13 St. James, Row, Sheffield.
,, 1	Wakefield—School Works	Education Committee	J. V. Edwards, County Hall, Wakefield.
,, 1	Strathspey, N.B.—Warehouse	——	C. O. Doig, Elgin.
,, 2	Leek, Staffs—Sewage Carrier	Urban District Council	W. E. Beacham, Town Hall, Leek.
,, 2	Keighley—Three Shops and Houses	——	J. B. Bailey & Son, 3 Scott Street, Keighley.
,, 3	Glasgow—Church	Corporation	Colin Young, 141, West George Street, Glasgow.
,, 3	Cwmavon—Police Station	Standing Joint Committee	Police Station, Port Talbot.
,, 3	Carrickfergus, Ireland—Caretaker's House	Urban District Council	Town Hall, Carrickfergus.
,, 3	Prestwich, near Manchester—Alterations to School	Education Committee	Clegg & Thorp, 41 Corporation Street, Manchester.
,, 3	Dublin—Training College Building	Commissioners	J. F. Fuller, 179 Great Brunswick Street, Dublin.
,, 3	Beverley—Infants' School	Education Committee	Hawe & Foley, North Bar Street, Beverley.
,, 3	Glasnevin, Ireland—Residence	Commissioners	J. F. Fuller, 179 Great Brunswick Street, Dublin.
,, 3	Lancaster—Balustrade Wall	——	Borough Surveyor's Office, Lancaster.
,, 5	Stranorlar, Ireland—Twenty-three Cottages	Rural District Council	Workhouse, Stranorlar.
,, 5	Wivenhoe, Essex—Alterations, &c., to Board School	Education Committee	F. Whitmore, Duke Street, Chelmsford.
,, 5	Ipswich—Enlargement of School	Education Committee	Bisshapp & Cautley, 32 Museum Street, Ipswich.
,, 5	Prudhoe, Northumberland—Five Houses	Mr. W. Wilkinson	Mr. Hall, Post Office, Prudhoe.
,, 5	Londonderry—House	——	E. J. Toge, Great James Street, Londonderry.
,, 5	Mountain Ash, Wales—School	Urban District Council	W. G. Thomas, Public Offices, Mountain Ash.
,, 5	Hindhead, Surrey—School	Education Committee	Jarvis & Richards, 36 Victoria Street, S.W.
,, 6	London, N.—Urinal Repairs	Islington Borough Council	J. P. Barber, Town Hall, Upper Street, N.
,, 6	London, N.—Repairs at Public Gardens	Guardians	J. P. Barber, Town Hall, Upper Street, N.
,, 7	Talgarth—Alteration to Farmhouse	Visiting Committee	Clerk's Offices, Asylum, Talgarth.
,, 7	London, N.—Extension of Hospital	Town Council	E. J. Lovegrove, Municipal Offices, 99 Southwood Lane, Highgate, N.
,, 7	London, S.W.—Public Baths	Chelsea Borough Council	Town Hall, King's Road, Chelsea, S.W.
,, 7	Macclesfield—Alterations to Inn, &c.	Lands and Buildings Committee	Borough Surveyor's Office, Town Hall, Macclesfield.
,, 7	Wolverhampton—Alterations to Schools	Education Committee	T. H. Fleeming, 10 Queen Square, Wolverhampton.
,, 8	Weaverham, Cheshire—Alterations, &c., to School	Sub-Committee	H. Beswick, Newgate Street, Chester.
,, 8	Sheffield—Training College	Education Committee	Gibbs & Flockton, 15 St. James's Row, Sheffield.
,, 10	Llanelly—Schoolroom	——	W. Wilkins, F.S.I., Llanelly.
,, 12	Croydon—Cottage Homes	Guardians	J. H. Smith, 41 Moorgate Station Buildings, E.C.
,, 12	London, W.—Public Offices	Acton U.D.C.	F. T. W. Millar, 2 Dartmouth Street, Westminster, S.W.
,, 13	Burslem—School of Art	Town Council	A. R. Wood & Son, Queen Street, Burslem.
,, 13	Colchester—Engine House	Corporation	C. E. Bland, Town Hall, Colchester.
,, 14	Newport, Mon.—Rebuilding Post Office	Commissioners	H.M. Office of Works, Storey's Gate, S.W.
,, 14	Portsmouth—Enlargement of Home	Committee	G. C. Vernon-Inkpen, 40 Commercial Road, Portsmouth.
No date	Cardiff—Rebuilding Showrooms	Messrs. Cross Brothers	H. Budgen, 95 St. Mary Street, Cardiff.
	ENGINEERING:		
June 1	Glasgow—Machinery	Corporation	Office of Public Works, City Chambers, 64 Cochrane Street, Glasgow.
,, 1	Much Haddam, Herts—Waterworks	Rural District Council	A. G. Gwynn, Bishops Stortford.
,, 2	Northam, Herts—Sinking Well, &c.	Gas and Water Co.	Company's Offices, New Barnet.
,, 2	Aspatria—Extension of Water Main	Water Board	William Pearson, Bank Chambers, Aspatria.
,, 2	Mansfield—Heating Apparatus	Education Committee	Vallance & Westwick, White Hart Chambers, Mansfield.
,, 2	Paris—Dredger	——	Colonial Office, 4 Rue Jean-Nicot, Paris, France.
,, 2	Valparaiso, Chili—Harbour Works	——	Minister of Finance, Santiago.
,, 3	Congleton—Exhauster	Gas Committee	J. Smith, Gasworks, Congleton.
,, 5	Ollerton, Notts—Boreholes	Water Committee	Water Engineer, St. Peter's Square, Nottingham.
,, 6	Partick, N.B.—Electrical Plant	Town Council	H. B. Maxwell, Borough Electrical Engineer, Partick, N.B.
,, 6	Edinburgh—Steam and Exhaust Pipe Work	Council	Engineer, Dewar Place Station Edinburgh.
,, 6	Kirkcaldy—Sewer	Town Council	J. & A. Leslie & Reid, 72A George Street, Edinburgh.
,, 6	Sedgley—Gasholder Tank, &c.	Urban District Council	Manager, Gasworks, Sedgley.
,, 7	Bracebridge, Lincs—Fire Alarms	——	E. B. George, Clerk of Asylum, Bracebridge Heath, near Lincoln.
,, 7	Talgarth, Wales—Wiring	Visiting Committee	Clerk's Office, Brecon and Radnor Asylum, Talgarth, R.S.O., Wales.
,, 7	Wolverhampton—Hot-water Apparatus	Education Committee	T. H. Fleeming, 10 Queen Square Wolverhampton.
,, 7	Bristol—Electric Cranes	Docks Committee	William Squire, Cumberland Basin, Bristol.
,, 7	Mode Wheel, near Manchester—Dry Dock, &c.	Ship Canal Dry Docks Co.	Company's Offices, Mode Wheel.
,, 10	Santander—Dredge	——	Junta del Puerto.
,, 14	Ossett, Yorks—Electrical Plant	Town Council	W. Emmett, 35 Commercial Street, Halifax.
,, 14	Carshalton, Surrey—Engineering Plant	Metropolitan Asylums Board	Office of Board, Embankment, E.C.
,, 14	Radstock, Somerset—Widening Bridge	Urban District Council	Council Offices, Radstock.
,, 14	South Brent, Devon—Waterworks	Totnes R.D.C.	R. H. Worth, 42 George Street, Plymouth.
,, 15	Ribera, Sicily—Aqueduct	——	Municipality, Ribera, Sicily.
,, 16	Rio de Janeiro, Brazil—Engines and Tools	——	Intendenciada Estrada de Ferro Central do Brazil.
	IRON AND STEEL:		
June 3	Glasgow—Ironmongery	Trustees of Clyde Navigation	Superintendent of Stores, 16 Robertson Street, Glasgow.
,, 5	London, N.—Lamp Columns	Hornsey Borough Council	E. J. Lovegrove, Municipal Offices, Southwood Lane, Highgate, N.
,, 6	Merthyr Tydfil—Iron Bandstand	Council	A. Rees, Clerk, Merthyr Tydfil.
,, 6	Paris—Galvanized Iron Wire	——	Colonial Office, 4 Rue Jean-Nicot, Paris.
,, 8	Paris—Iron Telegraph Accessories, &c.	——	Post and Telegraph Department, Rue de Grenelle, Paris.
Sept. 1	Sydney, Australia—Iron and Steel	——	Agent-General's Office, 9 Victoria Street, S.W.
	PAINTING AND PLUMBING:		
June 3	Teddington—Painting House, &c.	Urban District Council	M. Hainsworth, Elmfield House, Teddington.
,, 5	London, E.—Re-decorating Library	Stepney Borough Council	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
,, 5	Leicester—Painting Exterior Market Hall	Markets Committee	E. G. Mowbray, Town Hall, Leicester.
,, 7	Edgware, Middlesex—Painting, &c., at Workhouse	Guardians	F. J. Seabrook, Union Office, Edgware.
,, 8	Bootle, Lancs—Painting at Schools	Corporation	Borough Engineer's Office, Town Hall, Bootle.
,, 12	Bolton—Cleaning, &c., School	Education Committee	F. Wilkinson, Education Offices, Nelson Square, Bolton.
	ROADS AND CARTAGE:		
June 1	Gateshead—Street Works	Corporation	N. P. Pattinson, Town Hall, Gateshead.
,, 1	London, S.E.—Flints	Greenwich Borough Council	Borough Engineer and Surveyor's Office, Town Hall, Greenwich.
,, 2	Brighton—Kerb and Channel	Town Council	Borough Engineer, Town Hall, Brighton.
,, 3	Carrickfergus, Ireland—Granolithic Footpaths	Urban Council	Council Offices, Carrickfergus, Ireland.
,, 5	Loughton, Essex—Road Materials	Urban District Council	Surveyor to Council, Loughton, Essex.
,, 5	Norwich—Footpath Tar-paving	——	A. E. Collins, Guildhall, Norwich.
,, 5	Basford, Notts—Street Works	Rural District Council	G. W. Hawley, Burton Buildings, Parliament Street, Nottingham.
,, 5	Wickham Market, Suffolk—Road Materials	Rural District Council	T. W. Read, Clerk, Workhouse, Wickham Market.
,, 6	Wembley, Middlesex—Widening, &c., Road	County Council	H. T. Wakelam, Guildhall, Westminster.
,, 6	London, N.—Making-up Roads	Tottenham U.D.C.	W. A. Prescott, Coombes Croft House, 712 High Road, Tottenham.
,, 6	Merthyr Tydfil—Road Materials	Urban District Council	T. F. Harvey, Engineer and Surveyor, Merthyr Tydfil.
,, 6	Failsworth, Lancs—Road Materials	Urban District Council	G. F. Gray, Council Offices, Failsworth.
,, 7	Failsworth, Lancs—Street Improvement Works	Urban District Council	G. F. Gray, Council Offices, Failsworth.
,, 7	New Romney, Kent—Quartzite	Rural District Council	W. B. Smith, District Surveyor, New Romney, Kent.
,, 14	Pinner, near Hendon—Making-up Road	Rural District Council	J. A. Webb, Council's Engineer, Stanmore.
,, 14	Watford—Making-up Roads	Urban District Council	D. Waterhouse, Surveyor, Watford.
	SANITARY:		
June 1	Blaydon-on-Tyne—Scavenging	Urban District Council	R. Biggins, Council Offices, Blaydon-on-Tyne.
,, 1	Hazel Grove, Cheshire—Sewers	Urban District Council	G. S. Doncaster, Council Offices, Hazel Grove.
,, 3	Bundoran, Ireland—Sewerage Works	Rural District Council	Office of Clerk of District Council, Ballyshannon.
,, 4	London, S.E.—Sewers	London County Council	Maurice Fitzmaurice, County Hall, Spring Gardens, S.W.
,, 5	Ebbw Vale, Mon.—Sewer	Urban District Council	T. J. Thomas, Town Surveyor, Ebbw Vale.
,, 5	Prestwich, Lancs—Sewering	Urban District Council	Surveyor's Office, Chester Bank, Prestwich.
,, 6	Brentford—Sewer	Urban District Council	Nowell Parr, Clifden House, Boston Road, Brentford.
,, 6	Horsham, Sussex—Re-draining	Guardians	C. H. Burston, 6 West Street, Horsham.

Complete List of Contracts Open.—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	SANITARY—*cont.*		
June 6	Portslade-by-Sea—Removal of Refuse	Urban District Council	Surveyor, St. Andrew's Road, Portslade-by-Sea.
" 7	Herne Bay, Kent—Disinfectants	Urban District Council	F. W. J. Palmer, Town Hall, Herne Bay, Kent.
" 7	Glasgow—Sewers	Corporation...	City Engineer, City Chambers, 64 Cochrane Street, Glasgow.
	TIMBER:		
June 3	South Hetton, near Sunderland—Colliery Timber... ...	South Hetton Coal Co., Ltd. ...	J. A. Lambert, South Hetton.
" 3	Trimdon Grange, Durham—Colliery Timber	Messrs. Walter Scott, Ltd. ...	Storekeeper, Trimdon Grange Colliery.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
June 1	Donegal—Lighting Scheme	—	—	D. C. Pearson, Clerk, Donegal.
Aug. 1	Perth—Reconstruction of Hall...	30, 20 and 10 guineas	—	J. Begg, City Chambers, Perth.
" 1	Hove, Sussex—Library	£50, £30 & £20	£1 1s.	H. Erdacott, Town Hall, Hove.
" 1	Perth—Erection of new Hall	50, 30 and 20 guineas	—	J. Begg, City Chambers, Perth.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

Current Market Prices.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0	1	3	0
Clover, best	per load	3	15	0	4	2	6
Hay, good	do.	3	10	0	3	15	0
Sainfoin mixture ...	do.	3	10	0	3	17	6
Straw	do.	1	12	0	2	0	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ...	per cwt.	1	0	5	—		
Colza Oil, English ...	do.	1	4	6	—		
Copperas	per ton	2	0	0	—		
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate	per ton	16	0	0	—		
Do. red	do.	15	0	0	—		
Linseed Oil, barrels ...	per cwt.	1	0	6	—		
Petroleum, American ...	per gal.	0	0	$5\frac{1}{8}$	—		
Do. Russian ...	do.	0	0	$4\frac{3}{4}$	—		
Pitch	per barrel	0	8	0	—		
Shellac, orange	per cwt.	7	4	0	—		
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	4	0	—		
Tar, Stockholm	per barrel	1	6	6	—		
Turpentine	per cwt.	3	0	3	—		

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ...	per ton	78	0	0	—		
Iron, Staffs., bar ...	do.	5	15	0	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	10	0	—		
Lead, pig, Soft Foreign...	do.	12	17	6	—		
Do. do. English common brands	do.	13	3	9	—		
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14	0	0	—		
Do. pipe	do.	15	0	0	—		
Nails, cut clasp, 3in. to 6in.	do.	9	5	0	—		
Do. floor brads... ...	do.	9	0	0	—		
Steel, Staffs., Girders and Angles	do.	5	7	6	5	12	6
Do. do. Mild bars ...	do.	6	0	0	6	5	0
Tin, Foreign	do.	136	15	0	137	5	0
Do. English ingots ...	do.	137	0	0	139	10	0
Zinc, sheets, Silesian ...	do.	26	5	0	—		
Do. do. Vielle Montaigne	do.	26	10	0	—		
Do. Spelter	do.	23	15	0	23	17	6

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel	per load	2	10	0	4	15	0
Pine, Quebec, Yellow ...	do.	4	0	0	7	10	0
Do. Pitch, American	do.	2	8	0	5	0	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, Archangel, White, 1st, 3 × 11	per std.	12	15	0	—		
Do. do. Kem, Yellow, 1st, 3 × 9	do.	18	0	0	—		
Do. Asbacka, Yellow, 5th, 3 × 9	do.	7	5	0	—		
Do. Skonvik, Yellow, 3rd, 3 × 9	do.	12	10	0	—		
Do. Kalmar and Ronneby Yellow, Unsorted ... 3 × 9	do.	8	0	0	—		
Do. Norrkoping, Yellow, 1st and 2nd, 3 × 7	do.	9	0	0	—		
Do. Pensacola, Rio prime pitch-pine, 3 × 9	do.	10	15	0	—		
Do. Quebec, Bright pine, 5th, 3 × 11	do.	7	15	0	—		
Do. do. Spruce, Unsorted, 3 × 8	do.	7	15	0	—		
Battens, all kinds ...	do.	6	0	0	13	0	0
Flooring Boards 1in. prepared, 1st... ...	per square	0	10	6	—		
Do. 2nd	do.	0	8	3	—		
Do. 3rd, &c.	do.	0	6	6	0	9	6

HARD WOODS.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	3	17	6	7	5	0
Birch, New Brunswick...	do.	2	10	0	5	0	0
Do. Quebec do. ...	do.	2	10	0	5	15	0
Box, Turkey	per ton	7	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	$3\frac{1}{2}$	0	0	$3\frac{1}{2}$
Do. Honduras ...	do.	0	0	$3\frac{1}{2}$	—		
Do. Tobasco	do.	0	0	$3\frac{3}{8}$	0	0	$4\frac{11}{16}$
Elm, Quebec	per load	4	0	0	8	10	0
Jarrah, planks	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras...	per ft. sup.	0	0	$3\frac{1}{32}$	—		
Do. Tobasco ...	do.	0	0	$3\frac{7}{32}$	0	0	$5\frac{1}{8}$
Do. Cuba ...	do.	0	0	$2\frac{27}{32}$	—		
Do. African ...	do.	0	0	$2\frac{29}{32}$	—		
Oak, Wainscot	per log.	3	5	0	7	5	0
Teak, Indian, logs ...	per load	10	0	0	18	15	0
Do. do. planks ...	do.	13	0	0	20	5	0
Whitewood, American, logs.	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	3	0

Coming Events.

Thursday, June 1.

CHEMICAL SOCIETY.—Meeting at Burlington House at 8 p.m.

CARPENTERS' COMPANY.—Mr. James Bartlett on "Setting-out Joiners' Work," at 7.30 p.m.

Friday, June 2.

SOCIETY OF ARCHITECTS.—Visit to Chester and Liverpool. Leave Euston 10.30 a.m. Return Liverpool, Saturday, 5.20 p.m.

Saturday, June 3.

NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to Whitley Schools, St. George's Church, Cullercoats, and Tynemouth Priory, &c.

ARCHITECTURAL ASSOCIATION.—Second Summer Visit to "Parkwood," Henley-on-Thames (Mr. William Flockhart, architect). Train leaves Paddington 1.20 p.m.

Monday, June 5.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Business Meeting at 8 p.m. Announcement of Elections.

Wednesday June 7.

INSTITUTE OF SANITARY ENGINEERS.—Election Committee at 3.30 p.m. Organizing and General Purposes Committee at 5 p.m.

Friday, June 9.

ARCHITECTURAL ASSOCIATION CAMERA AND CYCLING CLUB.—Whitsuntide excursion to Belgium. Leave Charing Cross, 9 p.m.

Saturday, June 10.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to Inchcolm.

New Companies.

CUMBERLAND RED STONE CO., LTD., Crowdondale Quarry, Lazonby, R.S.O., near Carlisle. Capital: £4,000.

SIMMONS BROTHERS AND SONS, LTD., architects, auctioneers, surveyors, &c., 118, Cromwell Road, South Kensington. Capital: £8,400.

GEORGE WRIGHT, LTD., manufacturers of grates, stoves, &c., Burton Weir Works, Rotherham; 155, Queen Victoria Street, and at 238, Upper Thames Street, London, E.C. Capital: £35,000.

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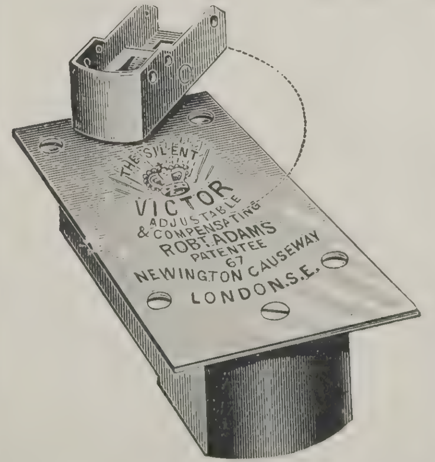

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Too late for Classification.

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See p. xx *for the Employment Register.*

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Persons Tendering will be required to deposit with the clerk, when handing in their Tenders, in a Bank of England note or cash, the sum of £5, which will be forfeited by the person whose Tender is accepted if the contract be not executed within seven days from the date he is informed it is ready for signature.

This deposit will be repaid to the parties Tendering who are unsuccessful.

The contractor will be required to pay all workmen on the Council's work the recognised Trade Union rate of wages.

A Schedule of such wages will be inserted in the contract, and the copy of the Schedule must be exhibited on the Pay Office at the Works.

Sealed Tenders on the form supplied, endorsed "Tender for Tar and Asphalte Paving Repairs," to be delivered to me by TWELVE o'clock NOON, on TUESDAY, the 6th JUNE, 1905.

No other form of Tender will be received.

Security will be required for the due performance of the Contract. The Council will not be bound to accept the lowest or any Tender.

By Order,
EDWARD CROWNE,
Clerk of the Council.
Tottenham,
26th May, 1905.

URBAN DISTRICT OF ACTON.

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The firm whose Tender is successful will, if the work is proceeded with, be required to enter into a Contract and a bond with two approved sureties for the due performance of such Contract.

The Council do not bind themselves to accept the lowest or any Tender for the work.

Applications, with references giving particulars of the principal works executed, and endorsed "New Town Hall," to be addressed to me, the undersigned, and delivered on or before the TWELFTH day of June, 1905.

By Order,
WM. HODSON,
Clerk to the Council.
Council Offices,
242, High Street, Acton, W.
12th May, 1905.

HENDON UNION.

TO BUILDERS AND OTHERS.

The Guardians of the above Union are prepared to receive TENDERS for PAINTING and sundry REPAIRS at their Workhouse, near Edgware, in accordance with the specification prepared by their Architect, Mr. E. P. THOMPSON, A.R.I.B.A., 25, Finsbury Square, E.C., a copy of which can be seen at my Office between the hours of TEN a.m. and FOUR p.m.

Sealed Tenders, endorsed "Tender for Painting and Repairs," to be delivered to me not later than WEDNESDAY, the 7th JUNE next.

The Guardians do not bind themselves to accept the lowest or any Tender.

By Order of the Board,
F. J. SEABROOK,
Clerk to the Guardians.
Union Offices,
Edgware,
18th May, 1905.

To Contributors.

THE EDITOR will be pleased to consider any articles illustrated or otherwise, dealing with old and new buildings, methods of construction, or other matter of an architectural character. He will also be glad to consider architectural photographs and sketches (the latter preferably in black and white) and measured drawings of work in this country or abroad. News items of interest to architects and builders will also be considered, provided the name and address of the sender are given; no notice will be taken of anonymous contributions. All communications should be addressed to the Editor of THE BUILDERS' JOURNAL, 6, Great New Street, E.C.

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1. A Free Advertisement of 12 words in the Wanted or Miscellaneous Advertisement Columns, in one issue of the BUILDERS' JOURNAL during each calendar month will be given to any regular reader.
2. The charge of one penny will be made for each additional word.
3. Advertiser's Name and Address or Box Number must be counted, but will in no case be reckoned as more than five words.
4. All advertisements must be accompanied by the correct remittance, and should a receipt be required a stamped addressed envelope must be enclosed.
5. The Proprietors reserve to themselves the right of refusing any advertisement.

II.—Free Answers to Enquiries.

1. The services of a large staff of experts are at the disposal of all regular readers who require information on architectural, constructional or legal matters.
2. Questions should in all cases be addressed to the Editor, and be written on one side of the paper only.
3. Correspondents are particularly requested to be as brief as possible.
4. The querist's name and address must always be given, not necessarily for publication

Note.—Owing to the large number of enquiries we receive weekly, we are compelled to restrict the advantages of this department to Regular Readers.

III.—Free Accident Insurance of £500.

1. Every regular reader of the BUILDERS' JOURNAL is entitled to the benefit of this Insurance.
2. A Pamphlet giving full details of this and other Insurance schemes inaugurated by the BUILDERS' JOURNAL for the benefit of its readers, and guaranteed by "The Ocean Accident Corporation, Limited," will be sent on application.

What is a Regular Reader?

We have employed the term "Regular Reader" throughout these announcements as the description "subscriber" is often understood to mean one who subscribes direct to the publishing office.

We mean by a Regular Reader anyone who has placed an order with us or any newsagent or bookstall for the BUILDERS' JOURNAL for one year.

Those readers who order the BUILDERS' JOURNAL through their local newsagent or bookstall should send us the newsagent's receipt. Their names will then be placed on our subscribers' list, and they will be entitled to all the advantages set out above.

5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS.
OFFICE: 6, GREAT NEW STREET, FETTER LANE, E.C.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

During the week ending May 26th twenty-five ailures in the building and timber trades in England and Wales were gazetted.

J. S. Hannaford, builder, Plymouth. Adj. May 19th.

J. Atkinson, quarry owner, Colne. R.O. May 18th.

W. Layton & Co., builders, Fulham. Adj. May 17th.

J. Goodacre, architect and surveyor, Leicester. Liabilities over £3,000.

Vallintine & Chandler, plumbers and painters, Dover. R.O. May 20th.

Whitehead & Saker, builders, Bromley. R.O. May 16th.

L. Smith, plumber and decorator, Hinckley. R.O. May 15th.

T. Morris, builder, Newport, Mon. Liabilities £2,517; expected to rank £567; deficiency £567.

Johnson Brothers, stone merchants and contractors, Monkseaton, Hartley and Whitley Bay. Adj. May 17th.

R. T. Peck, plumber and house decorator, Lowestoft. P.E., Great Yarmouth Town Hall, June 6th, at 11.

C. J. Edwards, builder, Thornton Heath. Adj. May 15th.

T. M. Taylor, builder, Lower Ashstead. Liabilities £2,089; expected to rank £1,621; deficiency £1,291.

Bromwich & Clark, slaters and tilers, Croydon. Adj. May 15th.

H. E. Carter, surveyor, London. R.O. May 16th. P.E., Bankruptcy Court, June 28th, at 12.

R. J. Cardiff, brick manufacturer, London. Gross liabilities £17,469; expected to rank £2,912; assets £4,189.

E. Hawking, builder, Dawlish. First meeting, O.R.'s, Exeter, June 1st, at 10.30. P.E., The Castle, Exeter, same day, at 11.30.

G. Railey, builder, Colwell. First meeting, O.R.'s, Newport (I.W.), June 5th, at 1.30. P.E., Newport Town Hall, same day, at 3.15.

E. Warren, builder, Addlestone. First meeting, 24, Railway Approach, London Bridge, June 2nd, at 12.30. P.E., Kingston C.C., July 11th, at 2.30.

A. W. Heminsley, builder and plumber, Small Heath. First meeting, 191, Corporation Street, Birmingham, May 31st, at 11. P.E., Birmingham C.C., June 29th, at 2.

W. Kenney, architect and surveyor, London. R.O. May 17th. First meeting, Bankruptcy Court, June 1st, at 11. P.E., same, June 23rd, at 11.30.

F. Swallow, joiner and builder, Great Grimsby. R.O. May 13th. First meeting, O.R.'s, Great Grimsby, May 31st, at 11. P.E., Great Grimsby Town Hall, June 1st, at 11.

E. A. Stacey, builder, Raynes Park. R.O. May 16th. First meeting, 24, Railway Approach, London Bridge, June 2nd, at 11.30. P.E., Croydon C.C., June 28th, at 11.

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Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, Builders' Journal, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Bridgend. — For the erection of two shops and dwelling-houses at Wyndham Street, for Mr. D. J. Griffiths. Mr. P. J. Thomas, architect, Bridgend:—

J. Lloyd	£1,675
D. L. Jones	1,626
Price & Morgan	1,575
W. Thomas	1,535
P. Gaylard*	1,512

* Accepted. [All of Bridgend.]

Bridgwater. — For the erection of a free public library on the site of Binford House, for the Town Council. Mr. E. Godfrey Page, architect:—

		Internal joinery in teak, oiled.
C. A. Hayes, Bristol	£3,993 0 0	£394 0 0
John Perkins & Son, Bristol	3,695 0 0	230 0 0
H. A. Forse & Son, Bristol	3,595 0 0	354 0 0
Alexander Poole, Ilminster	3,590 0 0	183 6 0
R. Wilkinson & Sons, Bristol	3,589 0 0	378 0 0
J. P. Flint	3,567 0 0	415 0 0
Gleed Brothers, Bridgwater	3,526 0 0	390 0 0
Henry Pittard & Son, Langport	3,524 0 0	172 10 0
Albert E. Demby & Co., Bristol	3,459 0 0	249 0 0
Collins & Godfrey, Tewkesbury	3,437 0 0	240 0 0
E. Lane, Bristol	£3,353 0 0	£169 13 5
T. Stockham, Bridgwater	3,321 0 0	229 0 5
Henry Spiller & Son, Taunton	3,250 0 0	330 0 0
Geo. Pollard & Co., Ltd., Taunton	3,217 12 8	382 14 3
J. E. Fursland, Bridgwater	3,175 0 0	190 0 0
Charles Taylor, Weston-super-Mare	3,100 0 0	159 0 0
C. Bryer, junr.,* Bridgwater	2,800 0 0	250 0 0

* Accepted.

Dundee.—Accepted for the erection of a new mission-hall in Taylor's Lane. Mr. Charles G. Soutar, architect 30, Whitehall Street, Dundee:—

Mason—John B. Hay.
Joiner—Garvie & Farquharson.
Plumber—T. M. Dewar.
Slater—James Laburn & Son.
Plasterer—James Laburn.
Glazier—Donald & Smith.
Painter—David Stewart.
[All of Dundee.]

Newbury.—For the erection of a Carnegie library and reading-room, for the Free Library Committee. Mr. S. J. L. Vincent, borough surveyor and architect. Quantities by the architect:—

T. Plumb	£1,983
A. J. Chivers	1,965
G. Elms	1,959
Hoskins Brothers*	1,920
A. Brazier	1,818

* Recommended for acceptance.
[Architect's estimate, £2,000.] [All of Newbury.]

Sheringham (Norfolk).—For the erection of new elementary schools, for the Norfolk Education Committee. Messrs. Olley & Haward, architects, Great Yarmouth:—

C. T. Baker, Ltd.	£7,874 0 0
Girling & Smith	6,753 0 0
G. Riches	6,734 0 0
R. Chapman	6,590 0 0
Carter & Wright	6,549 0 0
W. Porter	6,400 0 0
J. Youngs & Sons	6,348 0 0
G. A. Lines	6,323 11 0
G. E. Hawes	6,290 0 0
Spencer, Santo & Co	6,260 0 0
H. C. Greengrass	6,250 0 0
C. A. Sadler	6,247 0 0
J. W. Neale	6,200 0 0
H. Bullen	6,149 0 0
A. E. Chapman	6,145 0 0
T. Gill	6,080 0 0
Oak Building Co.	6,008 0 0
W. J. Hannant	5,997 0 0
T. H. Blyth	5,965 0 0
Blyth & Sons,* Sheringham	5,956 10 0

* Accepted. [Architect's estimate, £6,400.]

(*Continued on p.* xviii.)

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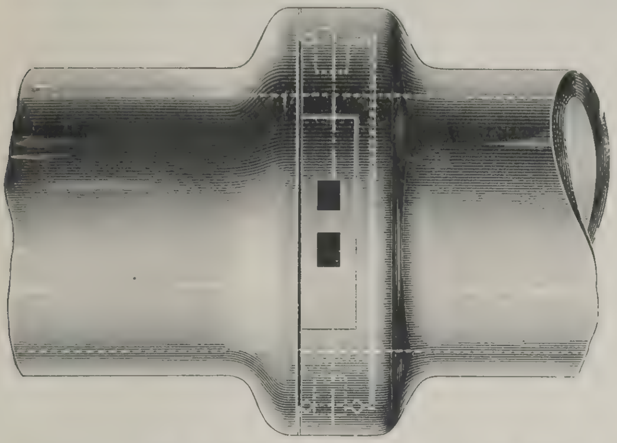

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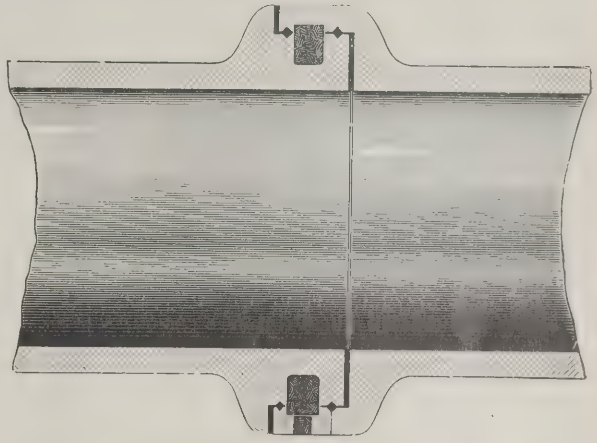
LIVERPOOL - - -	21, Leeds Street - - -	Josliffs	1887.
MANCHESTER - -	L. & N. W. Goods Yards, Ardwick -	Fireclay	2884.
BIRMINGHAM - -	1, Edmund Street - - -	Fireclay	4736.
SHEFFIELD - - -	38, Church Street - - -	Fireclay	2469.
HULL - - - -	South Side, Queen's Dock, Alfred Gelder Street - - - -	Fireclay	595.
NEWCASTLE-UPON-TYNE	4, Northumberland Street - -	Fireclay	877.
MIDDLESBROUGH - -	Royal Exchange - - - -		



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TENDERS—*cont. from p.* xvi.

Mountain Ash.—For the erection of 135 dwelling-houses, together with streets, sewers and surface-water drains. Messrs. Morgan & Elford, architects :—

	Per house.		
T. W. Davies, Port Talbot	£303	9	0
E. Thomas & Sons, Seven Sisters	281	10	0
Jones Brothers, Barry	260	0	0
Price Brothers, Aberdare	258	10	0
Jones Brothers,* Treharris	258	0	0
Osborne & Co.	239	7	0

* Accepted.

Norwich.—For proposed restoration of tower of the church of St. Gregory. Mr. Herbert J. Green, architect and diocesan surveyor, Norwich, King's Lynn and Lowestoft :—

J. Youngs & Sons	£823	0	0
G. E. Hawes	656	18	0
A. W. Hall	645	4	2
J. S. Smith*	619	0	0

* Accepted. [All of Norwich.]

Norwich.—For alterations and additions to 47, St. Giles's Street, for the Norwich Masonic Association, Ltd. Mr. Albert C. Havers, architect, 1, Bank Plain, Norwich :—

J. S. Smith	£2,700
J. Boddy & Son	2,516
J. Anderson & Son	2,497
R. Daws & Son	2,489
Scarles Brothers	2,465
J. Evans	2,455
J. Youngs & Son*	2,425
H. C. Greengrass	2,400
A. E. Chapman	2,399
T. Gill	2,397

[Architect's estimate, £2,400.]

* Accepted. [All of Norwich.]

Stody (Norfolk).—For partial restoration of church. Mr. Herbert J. Green, architect and diocesan surveyor, Norwich, King's Lynn and Lowestoft :—

Chaston & Grimson, Loddon	£2,793	9	7
Richard Chapman, Hanworth	1,626	1	2
R. W. Riches, Postwick	1,590	0	0

"PRINTERS' PIE," 1905.

ON June 1st will be published the 1905 issue of "Printers' Pie," the annual founded by Mr. W. Hugh Spottiswoode, with the assistance of Mr. Arthur Croxton, to benefit the funds of the Printers' Pension, Almshouse and Orphan Asylum Corporation, whose president this year is Mr. C. Arthur Pearson. Last year's "Printers' Pie" was completely sold out, and the success of the work has encouraged Mr. Spottiswoode to produce a much larger edition for 1905. The forthcoming issue will contain contributions from the Duke of Argyll, W. L. Alden, F. Anstey, G. B. Burgin, Lieut.-Col. Newnham Davis, General French, Tom Gallon, C. L. Graves, J. K. Jerome, E. V. Lucas, H. W. Lucy, Barry Pain, Major-General Baden Powell, C. Arthur Pearson, Mostyn Pigott, William Le Queux, W. Pett Ridge, Adrian Ross, Lord Stanley, G. R. Sims, Katharine Tynan, I. Zangwill, &c., and reproductions of drawings, including seven coloured plates, by Cecil Aldin, C. A. Buchel, E. Miriam Croxton, C. Dana Gibson, Dudley Hardy, John Hassall, L. Raven Hill, Gunning King, Phil May, Will Owen, Charles Pears, F. Pegram, L. Thackeray, David Wilson, F. H. Townsend, Lawson Wood, Starr Wood, &c.

Messrs. W. H. Smith & Sons have again generously placed their facilities at Mr. Spottiswoode's disposal; and in recognition of the efforts of the booksellers and newsagents of the country a contribution will be made from the proceeds of the forthcoming issue to the funds of the Booksellers' Provident Institution and the Newsvendors' Benevolent and Provident Institution. "Printers' Pie," 1905, will be published, as before, by the Proprietors of the "Sphere" and "Tatler," price 1s. nett.

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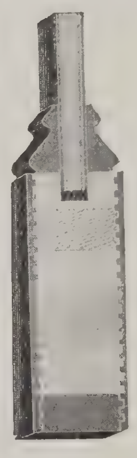

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THE

BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

June 7, 1905. Vol. 21, No 539.

6, Great New Street, Fetter Lane, E.C

Summary.

The Professional Associateship examination of the Surveyors' Institution will in future be called the Intermediate examination, and the Fellowship examination the Final examination. Three £80 scholarships for students have been arranged in connection with Cambridge University, and others elsewhere are suggested. (Page 317.)

The Sieges Allée, or Avenue of Victory, in Berlin, is adorned with thirty-two monuments, each having the statue of a Prussian ruler in the centre, flanked by the busts of two great men of his time. (Page 316.)

At St. Mary's, Great Warley, some beautiful church work has been designed and executed by Mr. Reynolds-Stephens. Metal has been extensively used for the interior, the chancel screen being of brass, the apse roof lined with aluminium, the pulpit of copper, bronze and marble, and the reredos of metal and marble. (Page 313.)

The masons and joiners on Tyneside have accepted a reduction in their wages, but the bricklayers and plasterers still hold out. (Page 323.)

Messrs. Spencer, Santo & Co. declare a dividend of 15 per cent. on their ordinary shares, carrying forward £1,193. They have acquired a large West End site on which to build business premises. (Page 323.)

Napsbury Asylum, opened on Saturday last, has cost £385,000. It accommodates 1,150 patients and the main corridor is about one quarter of a mile long. Mr. Rowland Plumbe was the architect. (Page 314.)

Mr. Reginald Blomfield writes to the "Times" criticizing Signor Manfredi's proposals for restoration work at St. Mark's, Venice. He protests against the rebuilding of the vaults, the removal of mosaics, and the proposed levelling of the floor, and calls to mind the recent restoration work at San Vitale, Ravenna, where expression has been given to the deadly theory that the facsimile is just as good as the original. (Page 313.)

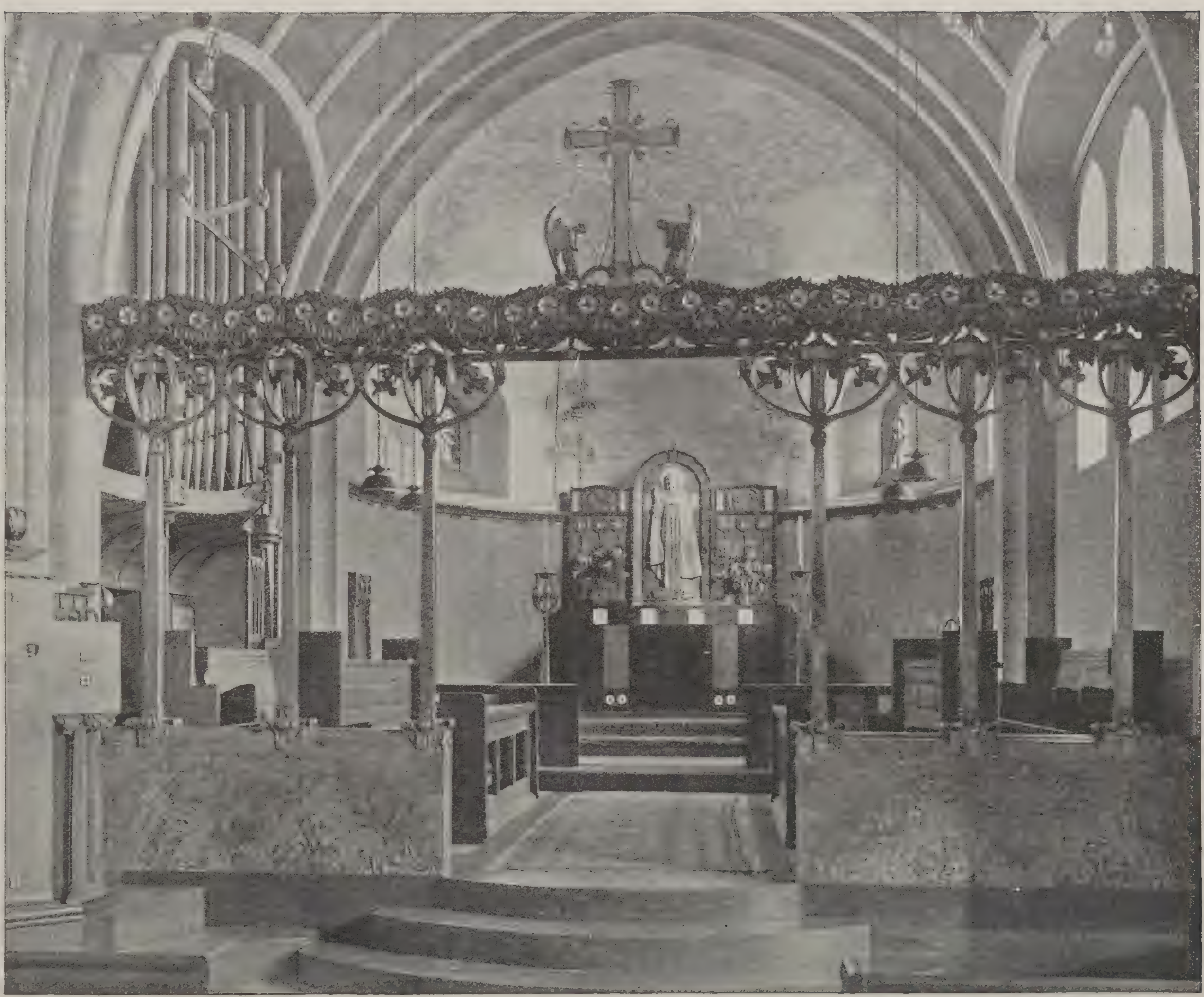
It is not likely that the London Building Acts Amendment Bill will be introduced in the next session of Parliament. (Page 323.)

There has been little change in the London wood trade during May. It has continued to be characterized by a small consumption, a moderate importation and a low level of prices. Until the dock deliveries show more improvement there cannot be much hope of a rise in prices. When they do, if the importation continues small, as there is every prospect that it will at present, the effect on the existing level of price should be immediate. (Page 322.)

The annual elections for the Council of the Royal Institute of British Architects resulted in the defeat of all but three of the candidates pledged to support the statutory registration of architects. (Page 320.)

Terra-cotta v. Stone. We have already announced the decision of the Board of Managers of the Glasgow Royal Infirmary to use terra-cotta for the outer walls of their new building, on the ground that stone decays in the Glasgow atmosphere. This decision, as reported in our columns, has evoked considerable opposition from the local stonemasons, who say it will displace 200 or 300 of them for several years. With the economics of the argument that money should be spent for the benefit of local labour we will not concern ourselves, but merely with the discussion that has taken place as to the suitability of the materials for their positions. Of course, the conditions of Glasgow are hardly different to those in most large towns, and the advocacy of terra-cotta as being superior to stone is but an echo of the controversy that raged some years ago when terra-cotta was generally boomed as the material of the future. Like everything else, however, terra-cotta has failed to prove the remedy for all ills, and it has had to be relegated to its proper place. Terra-cotta opposes to the destructive forces of the atmosphere a more or less vitreous skin, nearly but not quite impervious to moisture, but it should not be forgotten that in burning in the kiln this skin keeps the fire from the inside, and when weather does get to work on the latter, as it will in time with an acid air such as exists in seaside or manufacturing towns (or more quickly if the glaze is chipped), then disintegration is all the quicker. The temptation to workmen to chip it is great because of the unevenness in form that results from the twisting and warping in the firing. Another common fault, through no inherent defect of the material, is the colouring of the clay or the forming of a surface by the imposition of a skin of superior clay. Among the defects of terra-cotta are the impossibility of getting true planes and lines from block to block, the impossibility of alterations, and the weakness that results from a block being hollow, even when filled with concrete. It has its advantages, however, in the elaborate detail which is permissible (though this often leads to excesses), the richness of colour, and its cleanliness (more especially when glazed) and its low cost, all of which advantages furnish a reason for its use in particular circumstances. But stone still holds its place for strength, exactness of line and surface and carving, while as to weathering it only depends on choosing a good weathering stone or treating with a preservative solution. In this connection it is to be noted that an impervious surface is not always so advantageous as one which wears away slowly, for it will have been noticed that a stone like Portland decays just sufficient to remove the greasy soot and keep a clean white appearance without rapid disintegration, whereas terra-cotta or glazed ware gets a greasy skin that looks dirty.

The Weight of a Crowd. The fact that structural collapses are few and far between, and that they are generally due to extraordinary circumstances, such as fire or decay, does not allow us to neglect to be still more on the safe side if we can show that current practice is theoretically deficient. That few disasters occur is no doubt due to the adoption of a large factor of safety; this, however, should not be used to cover excessive loading, but only to guard against defective materials and workmanship. It will be recollected how a few years ago we were all startled by the collapse of a football stand at Glasgow, causing several deaths and severe injuries. The general conclusion drawn from this was that the consideration of the effects of a moving load, or of periodic vibrations produced by stamping or clapping, had not been taken into account by the constructors. The result has been that of recent years in all large centres where an event of importance takes place leading to the erection of stands for spectators, these and balconies, &c., are tested by the police by loading the stands with a body of men, who jump or stamp to give the effect of possible actual conditions. This guards against serious failure, but the result has often been to disclose great weaknesses in design, and where stands do pass the test we generally feel this must be due to the wasteful use of material and labour rather than to efficient design. It is well to use a large factor of safety, but the stresses should be properly gauged and then the members designed to carry these stresses. It would appear from some experiments carried out at Harvard that designers have generally under-estimated the weight of a crowd. It is usually assumed that the weight is about 45lbs. to 50lbs. per sq. ft. But the experiments to which we allude, and which were carried out by Prof. L. J. Johnson with the aid of undergraduates, show that football stands, bridges and platforms may have to sustain a considerably greater weight than that. Professor Johnson built a box 6ft. square and placed varying numbers of men in it. Eleven men weighing on the average 11 stone each were easily placed in it. That gave a load of over 47lbs. per sq. ft. But eleven men carefully placed only occupied places round three sides of the box; no fewer than forty men could be packed into the box if they were all made to face the same way. The average weight of these undergraduates was 11 stone 9lbs., and this would give a pressure per sq. ft. of 181lbs., which is nearly four times as much as constructors allow for. Yet at a football match, where all the spectators face one way, the crowding would be little less than in these experiments.



BRASS CHANCEL SCREEN IN THE CHURCH OF ST. MARY THE VIRGIN, GREAT WARLEY, ESSEX. DESIGNED AND EXECUTED BY W. REYNOLDS-STEPHENS.
C. HARRISON TOWNSEND, F.R.I.B.A., ARCHITECT.

THE USE OF METAL IN CHURCH WORK.

BY arrangement with the editor of the "Art Journal," and with the permission of the artist, we are able to give the accompanying three photographic illustrations of the chancel screen and altar rail in the church of St. Mary the Virgin, Great Warley, Essex, designed and executed by Mr. W. Reynolds-Stephens, with whom Mr. C. Harrison Townsend, F.R.I.B.A., was associated as architect of the building.

Mr. Reynolds-Stephens's scheme of decoration embraces the whole church, and is worked out in iron, brass, bronze and copper, with mouldings in plaster covered with aluminium; carved walnut panels and seats; and various coloured marbles. The woodwork, where not walnut, is painted a quiet green. The general effect is one of richness, harmony, beauty of design and correlation of colour. On entering the church from the west, the eye is led past the highly decorated ribs of the wagon roof, onward through the wonderfully rich metal screen, to the semicircular apse, the walls of which are covered with magnificent slabs of grey-green marble, and the roof entirely with aluminium. The roof is divided into five spaces by vine-branches treated architecturally, which unite and form a broad band of trellis two-thirds of the way up; the bunches of grapes and leaves are slightly tinted. The apse windows are arranged to throw light on the aluminium surface, producing a very beautiful effect. The figure of Christ, which forms the centre of the reredos, is (with the exception of the head) of metal, and stands on a great serpent of black oxidized copper, gleaming here and there with blue mother-of-pearl. The panels on either side are of marble, divided by three metal uprights, each of which ends in a rose surrounded by a crown of its own leaves. Two small upper compartments contain exquisite metal bas-reliefs of the Nativity and the Entombment.

The altar rails consist of dark-green marble upright slabs, rising from a broad base of marble, and enclosing in each panel a circular crown of thorns in brass, glorified by internal floreation, with three large single roses—a decorative note seen in every part of the church.

The chancel screen is perhaps the richest and most elaborate of all the decorations. It is formed of three flowering fruit-trees in brass, on each side of the central opening, which spring from a marble base or wall, as "founded upon a rock." Each tree bears an angel looking down the church, and representing respectively Joy, Peace, Long-suffering, Meekness, Faith and Temperance. "The greatest of these," Love, is placed on the cross which crowns the centre of this beautiful screen, and on either side of it are adoring angels, representing Gentleness and Goodness. The tree-tops form a long and thick wreath of mother-of-pearl roses and leaves in metal.

There is a corresponding screen separating a side-chapel from the nave; it is of walnut and pewter, and the design is based on the conventionalized form of the Oriental poppy, to symbolize Sleep and Death, in harmony with a beautiful memorial tablet over the main entrance.

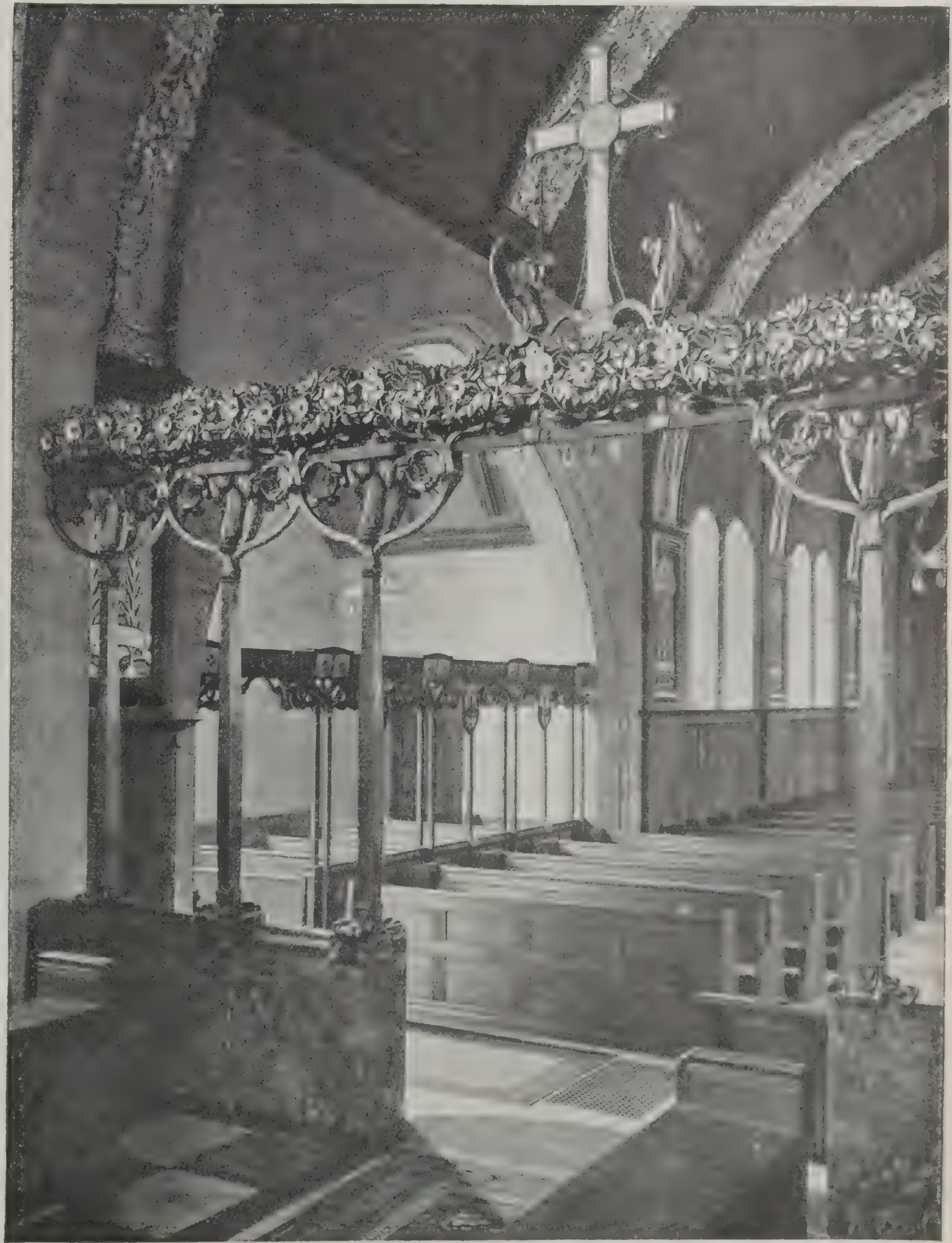
Of the other features of the church we may mention the decorated ribs of the nave roof, which spring from wooden pilasters and are coated with aluminium leaf; the pulpit, which consists of three broad copper crosses, joined at right angles at the transverse bars, backed by marble, and supported by bronze trees with floreation; the bishop's chair in the chancel; the altar frontal, displaying an enviable freedom from conventionality; the electric-light fittings; and the windows, which, with the exception of a few small ones of gem-like richness, are all light. Opposite the entrance are the angels of worship and praise, by Mr. Heywood Sumner, and near the font are child-figures by Mr. Louis Davis.

For further particulars and illustrations of this interesting church we would refer our readers to the "Art Journal" for March, to which we are indebted for the foregoing description.

THE REPAIR AND RESTORATION OF ST. MARK'S, VENICE.

A Criticism by Mr. Reginald Blomfield.

MR. REGINALD BLOMFIELD, A.R.A., writes to the "Times" in reference to St. Mark's, Venice. He says that no proposal has been made to do away with the iron ties which secure the interior of the building, as was first reported. Signor Manfredi proposes to remove the iron cramps on the exterior of the building and replace them with copper, a work probably of absolute necessity. "This so far is reassuring, but there are other points in the architect's proposals which are not so. . . . The serious structural failures are those of the two west bays of the nave, with the resulting injuries to the cupola above it and to the west window, and the settlements of the north-west angle and of the piers under the central cupola. . . . In regard to the two west bays Signor Manfredi proposes to construct detachable centering with all the parts fitted and numbered, which can be kept permanently in the workshops of St. Mark's and put up at once on the first sign of further failure. He further proposes to relieve the crowns of the vaults of all superincumbent pressure from the framing of the cupola, to renew the iron girdle fixed round the drum by Zendrini in 1723, and to reinforce it by another girdle around the base of the drum, and other structurally necessary works. So far the most staunch conservative would acquiesce in his methods, but it is painfully apparent that this ingenious centering, and the rest, are only a stepping-stone to the demolition and reconstruction of the vaults as soon as the funds permit. The failure in the west window is, Signor Manfredi maintains, due to the distortion of the vaults, and can only be adequately met by their reconstruction; but his own report makes it clear that this depression has been there for a long time. Zendrini drew attention to it in 1721 and dealt with it at the time. Some ill-advised alterations were carried out in the last century, but there is no evidence to show that the mischief has increased since that date or is now active.



VIEW FROM CHANCEL.

"Signor Manfredi himself could doubtless find other means of checking it than that of rebuilding So long as it is possible to provide against the effect of the distortion on the statics of the building in any other way, it is surely a piece of gratuitous vandalism to rebuild these vaults, with all that it involves to the interior of the building, because they are out of shape and offend an unfortunate passion for neatness.

"In the case of the angle of S. Alipio it may be necessary to rebuild . . . . There is probably no alternative to Signor Manfredi's general proposals in this case; but it is impossible to follow him in his suggested treatment of the four 'Tribunes.' He proposes to remove the mosaics, tie the piers round with metal bars, and replace the mosaics. Here, if anywhere, one would imagine underpinning to be the only effectual course. Signor Manfredi himself admits that the real evil is below the ground, and yet for unexplained reasons proposes to confine his labours to work above it. An ominous hint is suggested by his opinion that the mosaics are in a deplorable state and that the mosaicists should be ready to follow on the repairs to the walls. Is it possible that the *causa causans* for these recommendations is not so much the condition of the piers as the fancied shabbiness of the mosaics? If metal ties are all that is necessary, why remove the mosaics at all? Why not leave the mosaics alone—show the metal ties for what they are, and give up definitely the vicious attempt to convert a priceless old building into a new one? This, if one may without discourtesy suggest it, seems to be the real danger in Signor Manfredi's proposals. It appears frankly in his list of decorative restorations. His proposal to replace the external iron cramps with copper is, no doubt, necessary, but why "restore" the capitals of the gallery—that is, substitute mechanical reproductions for these weather-worn stones that have faced the salt winds of Venice for nearly 900 years? Why restore the bronze doors or the great pulpit, the "bigonzo," beyond what is necessary to hold them together? Why, last of all, take up the floor of the church and level it? . . .

"The levelling and renewal of the floor would not add one iota of strength to the building, but it would destroy the romance of centuries. The proposal raises the whole issue of 'restoration' in such cases—cases, that is, not of necessary public improvement, but of the conservation of historical monuments of great age and inestimable value. That Signor Manfredi and his colleagues are sincerely anxious to do what is best, one does not doubt for an instant; but it is the point of view from which they approach their task that is open to question. Recent works of restoration in Italy, such as those now being executed in San Vitale at Ravenna, reveal the deadly theory that the facsimile is just as good as the original, if only it is a sufficiently good imitation; but we are more the creatures of sentiment than we readily admit. The fact that for centuries people have wondered at these mosaics and knelt on this billowy floor is one not to be measured in terms, but it is a fact that will always have to be reckoned with, and one of a kind that justifies the genuine dislike and suspicion of restorations entertained by most sensitive people. We in England are hardly in a position to throw stones in this matter, but we are at least becoming conscious of our own iniquities, and on this ground may appeal to Signor Manfredi and the authorities of St. Mark's to stay their hand in all that is not absolutely necessary to the safety of the fabric."

Lambeth Bridge Unsafe for Heavy Traffic.—In consequence of the defective condition of Lambeth Bridge no vehicles of more than $2\frac{1}{2}$ tons will be allowed to cross, and all traffic will be required to proceed at a walking pace.

NAPSBURY ASYLUM.

THE Middlesex County Asylum at Napsbury, near St. Albans, was opened on Saturday. Mr. Rowland Plumbe, F.R.I.B.A., is the architect.

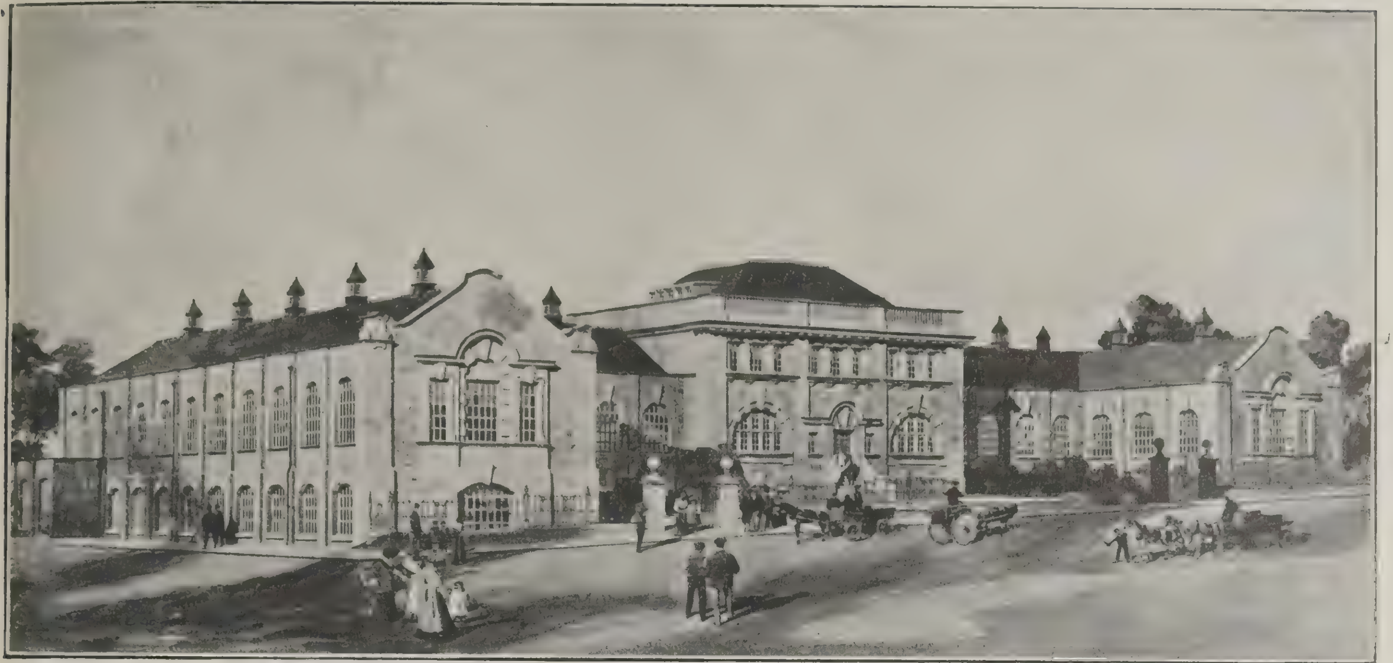
The principal entrance faces the main road from London to St. Albans, just beyond the village of London Colney. On entering, the corridors to the left lead to the "hospital" (*i.e.*, the portion of the building to which lunatics will be first conveyed, and from which, not very long after, many will emerge practically restored to normal health), while to the right are the reception-rooms, medical superintendent's and clerk's offices, and the committee-room.

The hospital comprises an entire block of buildings, and is complete in itself, with patients' and nurses' night and day accommodation, dining- and recreation-rooms. The cells are light, airy and of fair size. There are, of course, the usual padded rooms for violent cases. The corridors are wide, and afford space in some parts for indoor recreation, such as bowls or skittles. Owing to its general dimensions and freedom, the main corridor—which is about a quarter of a mile in length—has been nick-named the "bicycle track." Other detached blocks, which are built some distance away from the main building, are to be devoted to the reception of paying patients.

The Main Building.

The main building is, of course, for the accommodation of those patients whose stay in the asylum will necessarily be of longer duration. On either side of the corridors are the sleeping and sitting-rooms of the inmates, nurses' apartments and recreation-rooms. The dining hall is on the ground floor, spacious and lofty, and designed to accommodate about 600 persons. Immediately above is the concert hall, or theatre, which will accommodate an audience of over 800; there is a gallery at one end. The stage

ALTAR RAIL IN THE CHURCH OF ST. MARY THE VIRGIN, GREAT WARLEY, ESSEX. DESIGNED AND EXECUTED BY W. REYNOLDS-STEPHENS.



SILVERSMITH'S WORKS, HALIFAX. JOSEPH F. WALSH AND GRAHAM NICHOLAS, ARCHITECTS.

(fitted with fireproof curtain, &c.) is as large as that of an average London theatre, and every facility will be provided for the production of elaborate entertainments.

From the windows of both these rooms patients will be able to watch the out-door sports. There is a magnificent stretch of level greensward for cricket, quite as spacious as Kennington Oval.

The wards are arranged *en echelon* and are two-storeys high.

The Stores Department.

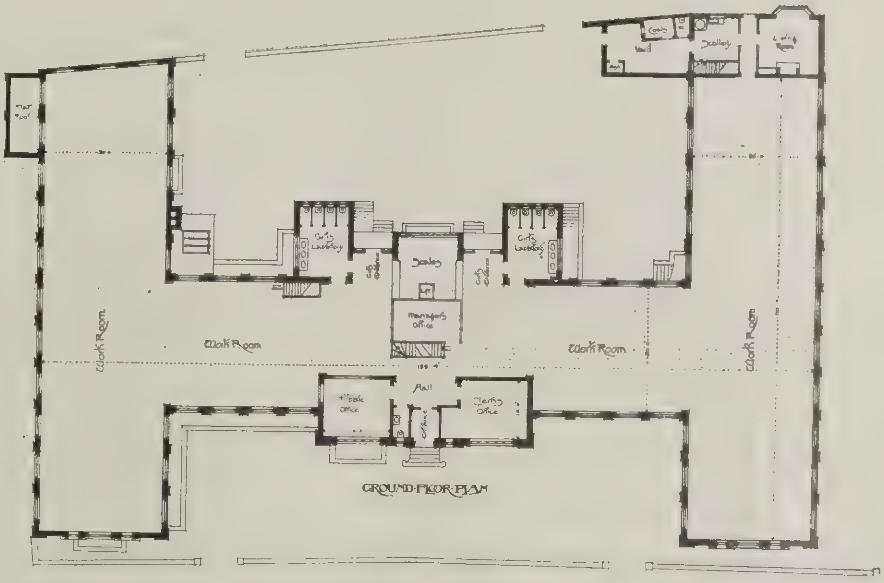
A very interesting portion of the main building is the stores department, which comprises granary, coal and other cellars, bakery, laundry, kitchens—all fitted with the most up-to-date machinery and appliances—steam engines and dynamos for operating the water and electric-light plants. Gas is also laid on both for lighting (chiefly as a reserve illuminant) and for cooking. There is a private siding from the Midland Railway, by means of which coal and other stores are delivered on the spot. It may also be added that a railway station is to be built adjoining the grounds, for the convenience of visitors to the asylum.

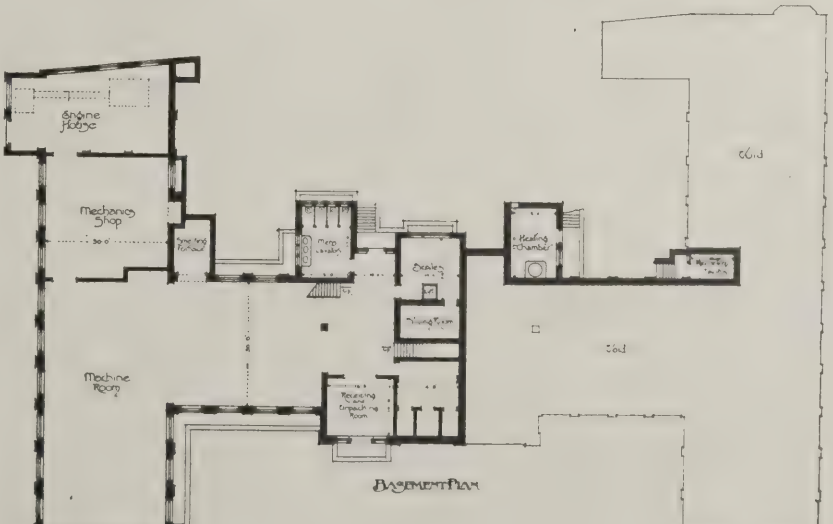
An interesting experiment (which has worked well) has been the laying-out of grounds and making of roads and paths by means of direct labour, employed under the superintendence of the Asylum officials, a course of procedure which was adopted in consequence of contractors' tenders very largely exceeding the estimate of the architect. In this way a relative saving has been effected, amounting to several thousands of pounds, by reason of the original apportionment for roads being adhered to.

The planting of shrubberies and flower beds has been carried out under the direction of Mr. Goldring, the well-known landscape gardener.

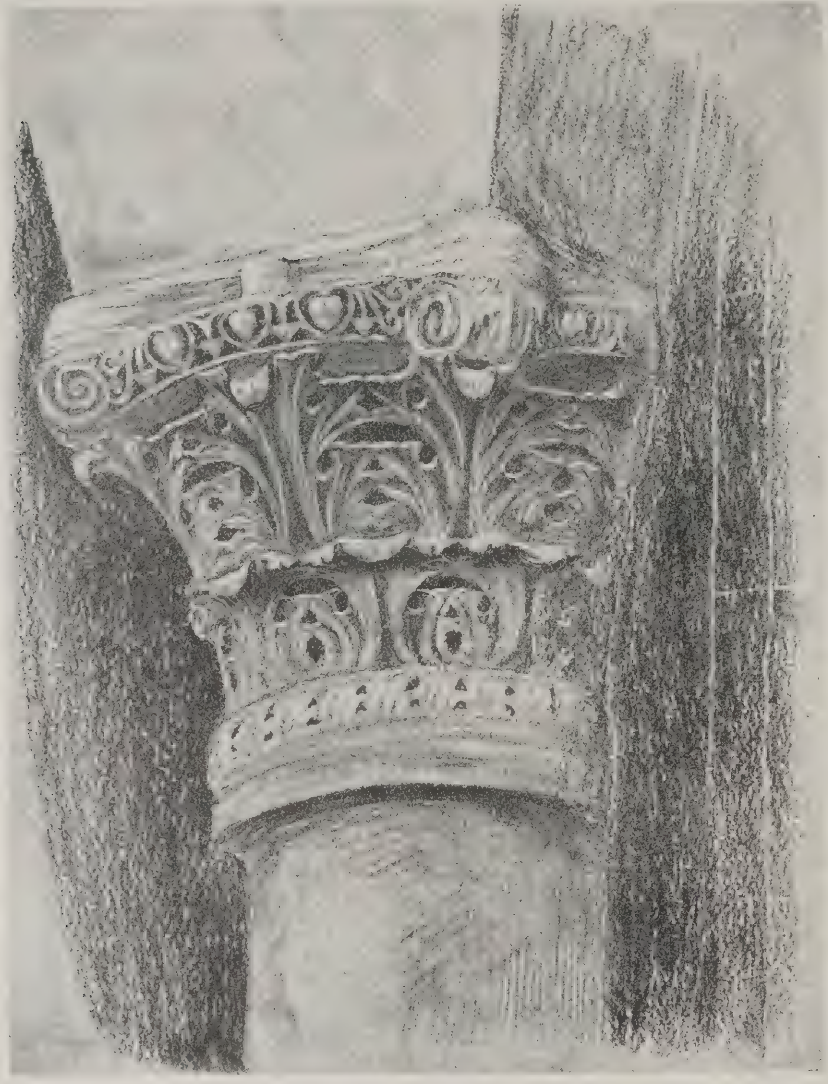
A visit to Napsbury would not be complete without inspecting the farm, which is admirably planned and stocked; the dairy too, is a model. All this is essential to an up-to-date asylum, not only for the raising of its own food and provisions, but on account of the beneficial occupation which the cultivation of the land affords to those patients who are suitable to undertake it.

The estate acquired for this asylum is about 416 acres and has cost £45,000, while the buildings, to accommodate 1,150 patients, have cost £387,000. Messrs. Charles Wall, Ltd., of Chelsea, were the builders.





These buildings, designed by Messrs. Joseph F. Walsh and Graham Nicholas, architects, of Halifax, have been erected for Mr. Charles Horner. The walls are of local sandstone grit, and the roofs are of blue slates. Inside, the walls are lined with a dado of salt-glazed bricks and moulded bricks, the floors being of maple blocks and terrazzo. The accompanying plans, together with the view above, fully illustrate the arrangements in a building erected for the manufacture of jewellery on a large scale.



BYZANTINE CAPITAL FROM THE MOSQUE OF DAMASCUS. DRAWN BY W. R. LETHABY.

Views and Reviews.

An Excellent Book on Mediaeval Art.

Professor W. R. Lethaby's great ability in the demonstration of the conditions which produced ancient art are well known, and in this work he has again sustained his reputation for adequately and succinctly criticizing that wide field of artistic activity—mediæval art in Europe. He traces the streams of influence which produced many phases of Gothic and Romanesque art, dealing with Rome and its relation to the East in the age of Constantine, and of the schools at Constantinople and Ravenna, to Romanesque in Italy, Germany, France and England, and thence to Gothic in France, England Spain, Switzerland, Germany and Italy. With Mr. Lethaby art is man's thought expressed in his hand-work. He shows clearly how "there is much more of the East in Gothic, in its structure and fibre, than is outwardly visible. To account for Gothic we have to account for its historic basis, and for the whole atmosphere of mysticism, chivalry and work-enthusiasm, with all the institutions, monastic, romantic, and social, which formed its environment." It is impossible to summarize in a short review the useful suggestive character of the book, and the many points touched upon by Professor Lethaby, but we advise everyone interested in the art of architecture to read it and draw their own conclusions. The book is well reproduced, and profusely illustrated with many photographs and numerous drawings by the author, one of which is here given as an example of beautiful draughtsmanship.

"Mediæval Art, from the Peace of the Church to the Eve of the Renaissance, 312-1350," by W. R. Lethaby. London: Messrs. Duckworth & Co., price 8s. 6d. nett.

THE NEW BERLIN.

Berlin has been practically rebuilt during the last twenty years and affords a good object-lesson in civic embellishment.

Some of the more important buildings and monuments erected in the last few years are: The Damm-muhlen buildings, a castellated reproduction of the royal mills, 1893; Luther Monument, 1895; Marein Kirche, rebuilt in 1894; new district courts with lofty rococo towers, recently completed; the enormous police headquarters, 1890; Church of St. George, 1898; Pius Kirche, 1894; statue of Senefelder (inventor of lithography), 1892; Museum of Natural History, 1889; Gnaden Kirche (a Romanesque church erected in honour of Empress Augusta), 1894; German Colonial Museum, 1899; the Reichstag buildings, 1894; National Monument to Bismarck, 1901; Sieges Allée, or Avenue of Victory, 1901; Emperor Frederick Memorial Church, 1895; Lessing Monument, 1890; Wagner Monument, 1903; statue of Queen Louisa, 1880; Potsdam and Victoria Bridge, with fine bronze statues, 1898; Teltow Courthouse, 1891; Hofman Haus, 1900; the new cathedral, 1903; National Monument to Emperor William the First, 1897; the Schloss Brunnen, monumental fountain in front of the palace, 1891; royal stable and carriage house, 1900.

The Sieges Allée, or Avenue of Victory, runs from the Königsplatz through the Tier Garten; this fine avenue, completed in 1901, is adorned with thirty-two monuments. Each monument is a marble hemicycle, in the centre of which rises the statue of a Prussian ruler, flanked by the busts of two great men of his time. These thirty-two statues are of unequal merit, but interesting.

TIME WASTED IN WATCHING CONSTRUCTION.

Someone with a statistical turn of mind has called attention through one of our American contemporaries to the time wasted by citizens who stop to watch the construction of "skyscrapers," with their steel and hollow-tile and terra-cotta, brick or stone veneer walls.

As an average, fifty persons are taken as the number for the eight working hours as looking on at the work of dismantling the old building through a period of thirty days. This work is interesting enough, but fewer people look on at it for the reason that there is dirt and dust, and perhaps a fence shuts off much of the early part of the work.

Modern methods of excavating for foundations become more interesting, and an empty wagon suspended in air 30ft. up, and lowered into the basement level by a steam crane, is a sight for almost anyone.

1,500 Spectators.

By all odds, however, the steel construction makes the mazes of congestion in the streets. With its necessary choking of traffic, the interest on the part of the individual pedestrian is multiplied until at the noon hour on a bright day 1,500 people may be lined north and south and east and west watching the great girders rising 150ft. into the air to the sputterings of the donkey engine, regulated by the boatswain's whistle which pipes somewhere unseen in the skeleton of the structure.

The Human Spider.

As the steel construction grows in height, this street interest also increases. It exacts greater exertion on the part of the spectator, but he gets more out of it. Perhaps as one of these girders rises to some particularly troublesome point in the spidery heights of the structure a workman may be poised upon it, signalling, and looking like a human spider in his web of steel. At such a time business comes more nearly stopping in the sight of the picture than it might were a fire ranging there. The chance of the man's fall—the dizziness of the height—the diminutiveness of man as compared to his work—all have the allurements that appeal to the man with the least flexible of necks.

Next in order of interest is the elevation of the granite blocks of a building, the stones weighing tons in some instances and yet going up with all the ease of the old oaken bucket that hung in the well. Men showing as black dots in the upper structure; the chatterings of the pneumatic riveting machines sounding like giant woodpeckers at work in a forest of steel; the roar of the work of the builders, mingling with the roars of traffic in the streets—all cause waste of time in watching.

The Delays Caused.

Every type of man, boy, woman and girl is represented in the spectators looking upon the work of the builders or elbowing through the congestions in the streets

The messenger boy with the expected note or package has stopped to look, and the minutes are going beyond his count.

The street car is delayed and maledictions are cast upon the company and the crew alike when the skyscraper is to blame. Trains are missed by passengers. The nervous one is shocked when he suddenly finds himself under 5 tons of skeleton steel rising 100ft. up, while the pedestrian with the spirit of hurry goading him plunges at the lines of congested onlookers, anathematizing as he goes.

From the windows of buildings around the new skyscraper there are complaints of the losses that come to those employing help. Looking down upon the work of the builders, no less than looking up at it, has its fascinations, and there are months of lost working days to be credited to the office employees looking down, in addition to the years that are lost in the aggregate by the pedestrians in the streets looking up

SURVEYORS' INSTITUTION EXAMINATIONS.

AFTER much consideration, the Council of the Surveyors' Institution have decided to change the names by which the Professional examinations have hitherto been known. The Professional Associateship examination will in future be called the Intermediate examination, and the Fellowship examination the Final examination, thus getting rid of some ambiguity as regards the claims of candidates to immediate admission to the classes of membership which have hitherto been associated with these particular examinations.

Misapprehension about Fellowship.

As regards the Fellowship, it is a misapprehension to suppose that a candidate who has passed what has hitherto been known as the Fellowship examination is entitled, on reaching the minimum age prescribed by the by-laws, to be transferred to the highest class of membership. It is apparently not clearly understood that the candidate for transfer must fully satisfy the Council that he has had such experience in practical and responsible work as the public are entitled to look for in a person describing himself as a Fellow of the Institution. Subject to the rules, it is open to anyone to enter for the Final examination at the time most convenient to himself, but before the Council will transfer him to the Fellowship he must satisfy them that he has had five years' experience as a surveyor in circumstances satisfactory to the Council, either—

(*a*) As a principal in an established business as defined by the by-laws.

(*b*) As responsible manager of an established business as defined by the by-laws.

(*c*) As head of a department in the office of a public body, reporting direct to his Board or Council.

The New Scholarships.

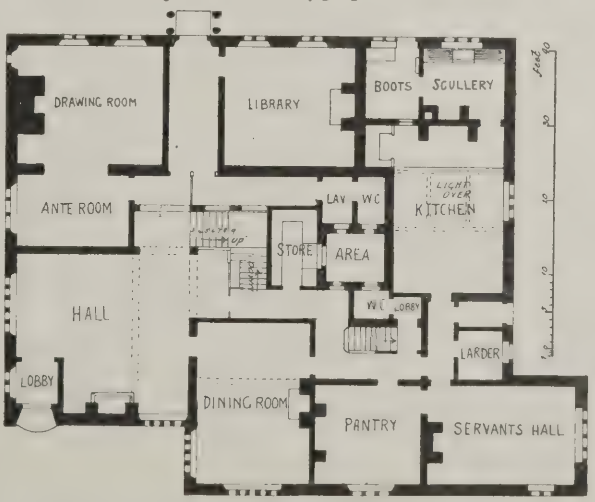
The council of the Institution have been occupied during the past year with the consideration of schemes for extending the scope and raising the standard of professional education by bringing the advantages of university training within the reach of such students as are desirous of acquiring systematic training in some of the scientific subjects cognate to their profession, and a scheme has been agreed on between the council and the Senate of Cambridge University with regard to scholarships open to students of the Institution. There are to be three scholarships, of £80, one awarded every year and tenable for three years.

Somewhat similar offers have been made to the Universities of North Wales and Durham, in the interests of students from the northern and western districts of the kingdom.

The council had hoped to open the competition for these scholarships to Fellows and Professional Associates as well as to students, but to do so would infringe specific provisions in the charter and by-laws, and they have, in consequence, been compelled to limit their offer to students.

It may be mentioned in this connection that by way of still further linking the Institution examinations with the teaching universities, the council have agreed to accept the Bachelor of Science degree in the department of agriculture in the University of Edinburgh as qualifying candidates for the professional examinations of the Institution.

Mr. Charles Bidwell is the new president of the Institution, succeeding Mr. H. T. Steward.



"MINSTED," MIDHURST SUSSEX: GROUND-FLOOR PLAN.

Keystones.

New Grammar School, Lincoln.—The Board of Education has passed the plans of this school by Mr. Leonard Stokes, F.R.I.B.A.

The Mall.—The King particularly desires that the historic name of "The Mall," leading from the Queen Victoria Memorial to the Admiralty, shall not be replaced by the term "Processional Road."

Plans for new Council Schools at Middlewich, Cheshire, for 800 mixed scholars, prepared by Mr. Joseph Cawley, M.S.A., of Northwich, have been approved by the Board of Education and the Cheshire County Council.

Mr. Sydney Mitchell, of Edinburgh, who has designed many churches in Scotland, has been appointed architect and professional adviser to the Managing Board of St. Giles's Cathedral Edinburgh.

Edinburgh University Union.—A block of buildings to cost £8,500 is to be added to the Edinburgh University Union. It will be partly three and partly four storeys high, and will contain a spacious library, a writing room on the second storey, and five rooms for office and committee work. There will be a large new kitchen with servants' hall on the top storey.

Collapse of a new Bridge.—On Saturday a new suspension bridge which had just been erected over the River Irvine near Dean Castle, at Kilmarnock, gave way. After the formal ceremony of opening had been gone through, a rush of people was made to cross the bridge, and the structure collapsed and fell into the river. It was a wire-rope suspension bridge with iron columns set on concrete piers, and was designed to bear 20 tons. It is alleged that there was a latent defect in a link of one of the anchor chains, and that this caused the chain to give way, thus throwing the whole strain on one side and pulling one of the wire ropes through the socket of the fastening block.

The Simplex Steel Conduit Co., Ltd., have found it necessary to build new factories at Garrison Lane and Maxstoke Street, Birmingham, in order to meet the greatly increased demand for their conduits and fittings. The works are equipped with the most up-to-date machinery and labour-saving appliances. Special arrangements and facilities have been made to maintain quick delivery, a large and representative stock being held, so that all demands may be met immediately.

A Discussion on Sanatoria for Consumption, their design and location, will take place at the meeting of the Royal Sanitary Institute to be held at the Parkes Museum on Friday, June 16th, at 4.30 p.m. The discussion will be opened by Mr. Edwin T. Hall, to be followed by Messrs. H. Percy Adams, T. W. Aldwinckle, T. W. Cutler, Dr. C. Reinhardt, A. C. Scovell (chairman of the Metropolitan Asylums Board), Dr. J. E. Squire, Dr. F. R. Walters and Dr. C. Theodore Williams. Tickets for the admission of visitors may be had on application to the secretary of the Institute, Mr. E. White Wallis. On the following day a visit will be paid to the Heatherside Sanatorium at Frimley.

Ruskin.—Mr. George Allen announces in a pamphlet some new editions of Ruskin in the 2s. 6d. series. Those of them, however, which include the original illustrations will be 3s. 6d.

£337,000 Street Improvement. — The Hammersmith Borough Council has approved a scheme for the widening of King Street, from the Broadway to Waterloo Street, at an estimated cost of £337,000. This is part of the main thoroughfare leading from Piccadilly to the western districts of London.

Hatchett's Restaurant.—The kitchen department at this well-known Piccadilly restaurant has been entirely reconstructed and enlarged and fitted with modern cooking appliances by Messrs. Benham & Sons, Ltd., of Wigmore Street, W. The sculleries and plate and glass rooms have been provided with new dressers, plate and pot racks, &c. New hot and cold water and gas supplies have been installed (including services to the new bar and ladies' lavatory), and new larders and cool rooms have been constructed.

A new Wing to St. Peter's School, York, was opened on Thursday last. It contains sitting-rooms, bedrooms and breakfast-room for three resident masters, study accommodation for twenty senior boys, two large preparation rooms for juniors, each accommodating eighteen, dormitory accommodation for fifty-five boys and sanitary arrangements. The work has been carried out at a cost of about £6,000 by Mr. T. S. Ullathorne, of Selby, from the designs and under the supervision of Mr. Walter H. Brierley, architect, of York.

Obituary.

Mr. R. P. Whellock, A.R.I.B.A., of London, died recently, aged 70.

Alderman W. H. Dunn, architect, of Gateshead, died recently, aged 62. He was a past-president of the Northern Architectural Association.

Mr. Robert Laing, well known in the building trade of Dundee and district, died last week, aged 69. He was the builder of the Esplanade at Dundee.

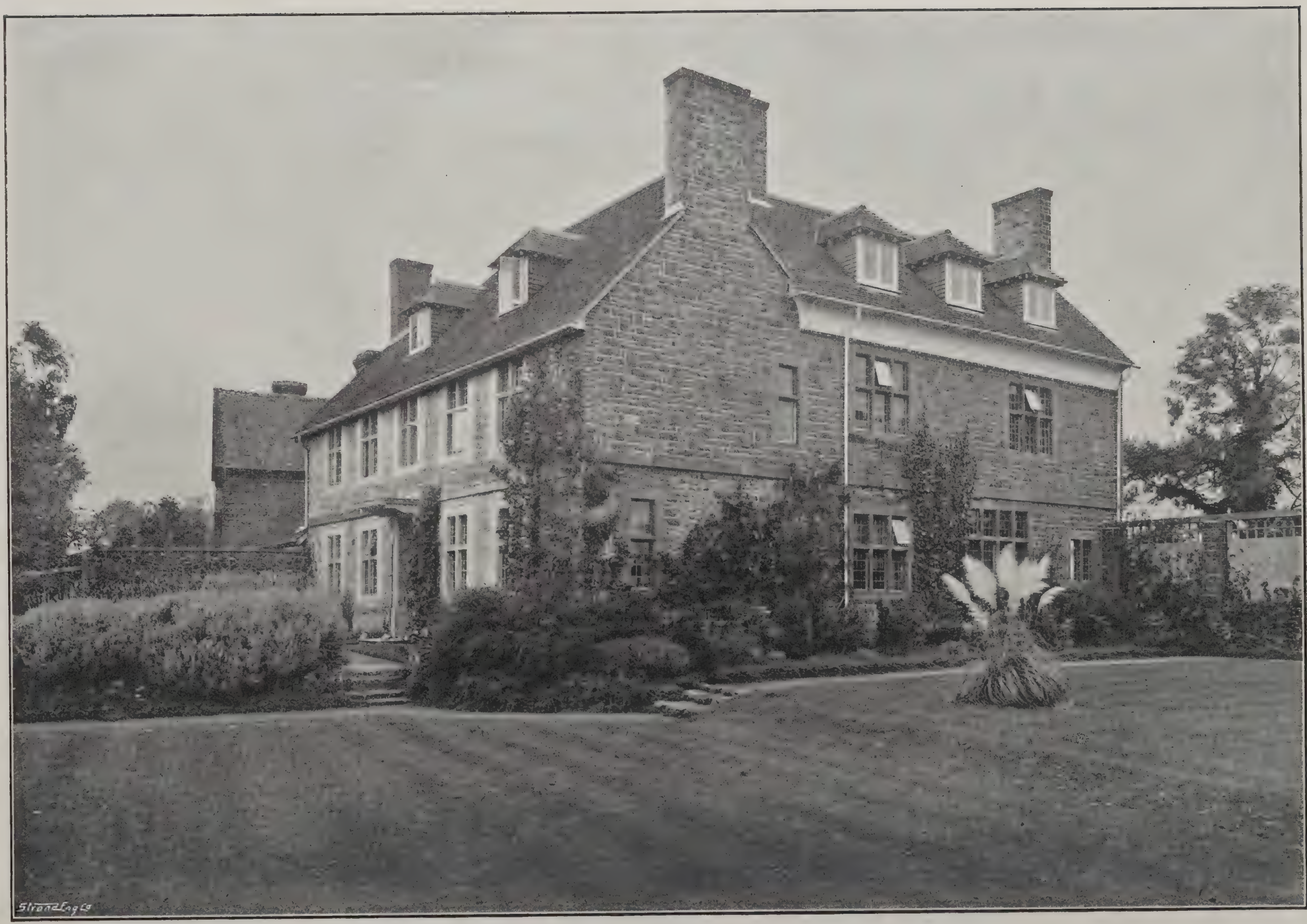
Competitions.

The King's College Hospital Competition Drawings are on view at the Art Galleries, Camberwell, till Monday next.

Coventry and Warwickshire Hospital Extension.—The design of Messrs. A. Hessell Tiltman, of London, and Mr. H. W. Chattaway, of Coventry, has been adopted. It is estimated to cost £35,000. Four sets of designs were submitted.

A SUSSEX HOUSE.

"MINSTED," Midhurst, Sussex, designed by Mr. Mervyn Macartney, is situated at the base of The Downs, and is built of stone from the Cowdray estate. The floors and staircase are of oak, the hall and dining-room being panelled in the same material. In the dining-room is a plaster frieze by Mr. George Jack. The contractors for the house were Messrs. Maides & Harper, of Croydon.



" MINSTED " MIDHURST SUSSEX: FROM THE GARDEN. MERVYN MACARTNEY, ARCHITECT.

Correspondence.

A Village Chapel.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I think some explanation is necessary to my design for the interior of a village chapel hung in this year's Academy, and illustrated on p. 292 of your issue for May 24th. The interior is that of a small Congregational church erected in the delightful golfing village of Hestbank on Morecambe Bay, near Lancaster, at which place I have a summer cottage. Nearly three years ago, acting on my advice, the building committee of the Centenary Congregational Church, Lancaster, employed Mr. Dan Gibson, architect, of Windermere, to prepare plans, which were in every way suitable and most ably designed, but, as so often happens, the designs "in committee" were reduced to something less than barren necessity. It was in this state that I found the church, which I had hoped would mark the beginning of better days for village free church architecture (a wide field, let me add, entirely untouched by either reverent designers or craftsmen); and my work, which has been purely a work of love, and so far has been carried on without encroaching on the funds of the church, has been to give a little colour and interest to the bald and bare interior. As always happens, this work is now costing more than was saved by the reduction of the architect's design, but I have had the sympathy of a few enthusiasts like myself, and the financial help of many onlookers, including Colonel Sandys, M.P., Mr. George White, M.P., Mr. W. H. Lever, Mr. S. J. Waring and many others, whilst Mr. Carnegie has offered to give the second half towards a new organ, the case of which I have designed; but to complete the scheme many more helpers are still required. Behind the screen shown in the drawing there are curtains hung. The screen reduces the size of the church by one-fourth for the greater comfort of the small winter congregation. The seating capacity inside the screen is seventy-two. The four centre panels fold back, allowing seating accommodation for an additional twenty-four. The carving for the screen and pulpit is being executed by Mr. Arthur Simpson, of Kendal; the stencil decoration on roof will, I am afraid, have to wait for some time, as the other work will exhaust the funds in hand.

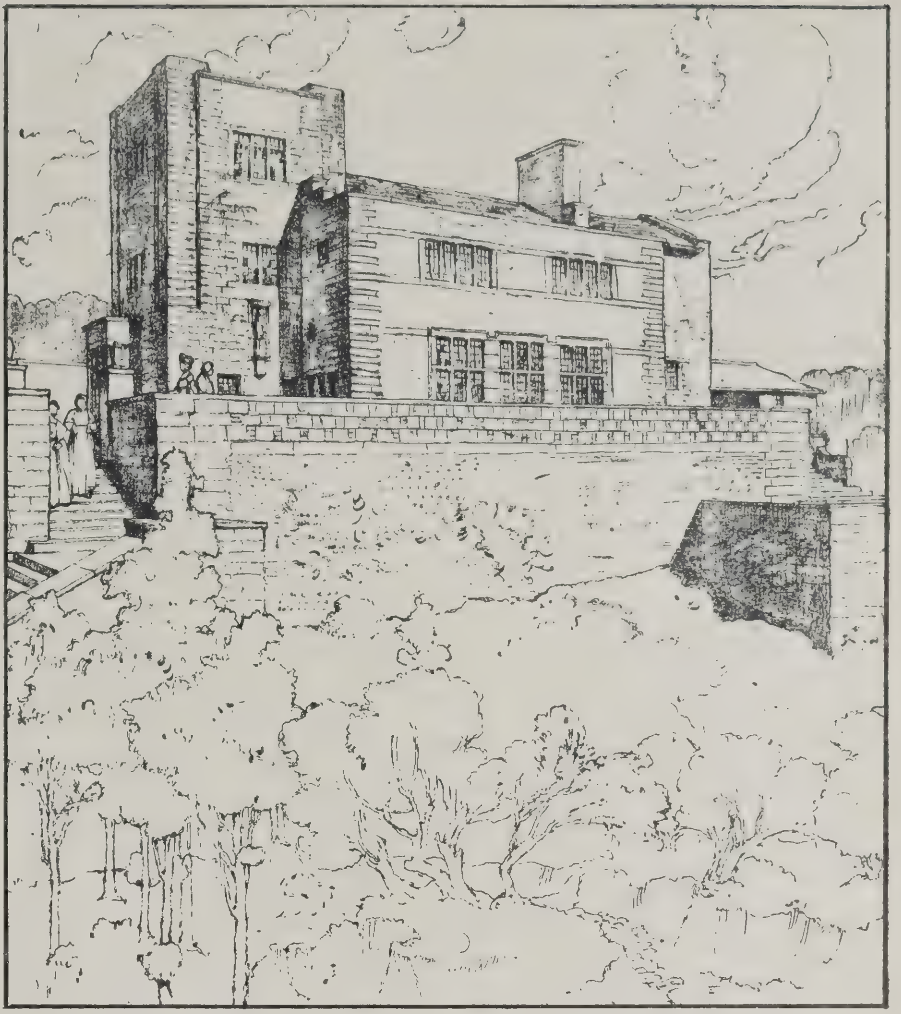
In conclusion I ought to add that whilst this work has been personal and honorary, the architect responsible for the building has been consulted and has generously advised on many matters for the completion of what has been to me a very interesting piece of work.—Yours very truly,

THOMAS W. MAWSON, Hon. A.R.I.B.A.

P.S.—"The Corbels," illustrated in your issue for May 24th, is my own residence when at Windermere.

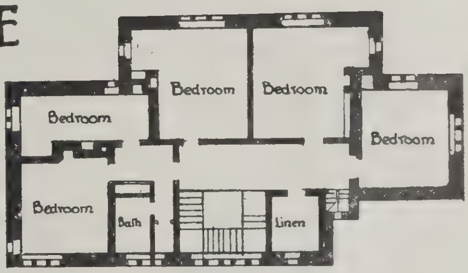
Law Cases.

A Question of Light.—The case of *Mellody* v. *Howarth* recently came before Judge Coventry at the Blackburn County Court. This concerned the erection of an addition to the wall dividing the yards of the plaintiff's and defendant's houses, by which it was alleged the light to the plaintiff's kitchen had been interfered with. The original height of the wall was 5ft. 9ins. and the addition was 6ft., making a total of 11ft. 9ins. His Honour said that the whole case was whether the obstruction caused substantial inconvenience in the ordinary use of the room of a house like this. He was of the opinion that if an extremely fine photographic test were applied it might be found that an infinitesimally longer exposure might be needed now, but for the ordinary uses of a house it would practically make no difference. Verdict for defendant, with costs.

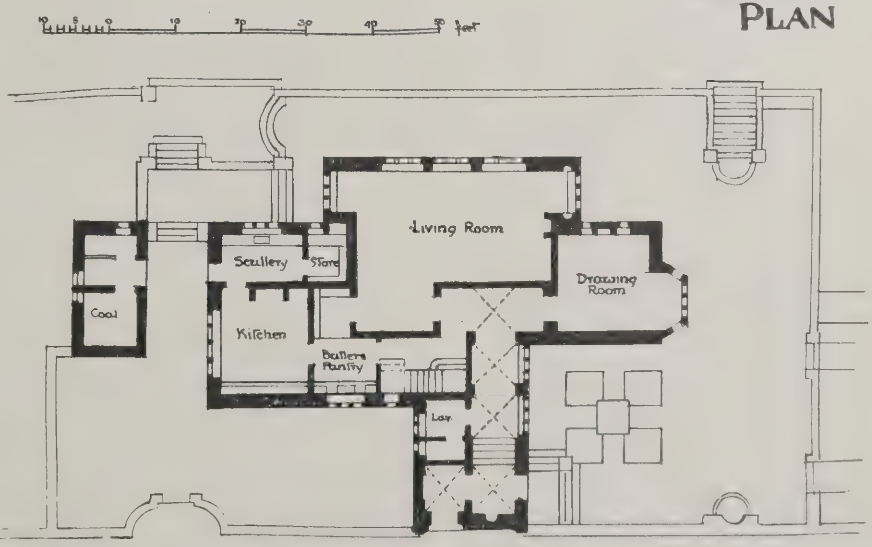


STVDY FOR
A YORKSHIRE
HOVSE

J HENRY SELLERS
ARCHITECT
78 CROSS STREET
MANCHESTER



BEDROOM
PLAN



This house is proposed to be built with walls of local stone and the roof covered with light green slates: woodwork of oak in living-room and staircase.

R.I.B.A.

The New Council: The Registrationists Defeated.

A BUSINESS MEETING of the Royal Institute of British Architects was held on Monday evening at 9, Conduit Street, W., the chair being occupied by the president, Mr. John Belcher, A.R.A.

After the minutes had been read, the report of the elections was announced. The total votes recorded were 1,081. The figures after each name represent the votes given. Only three members of the Council are known to be registrationists, and thus it means that the candidates pledged to support the statutory registration of architects have been unsuccessful—a complete reversal of last year's result.

(*a*) signifies that candidate was pledged against registration.

(*r*) signifies candidate pledged to support registration. Those not marked were non-party candidates.

The result was as follows:—

President.

John Belcher, A.R.A.

Vice-Presidents.

ELECTED.

H. T. Hare (*a*)	840	E. T. Hall (*a*)	641
Leonard Stokes (*a*)	674	Sir John Taylor (*a*)	611

NOT ELECTED.

Alfred Darbyshire (*r*)	472	Butler Wilson (*r*)	351
S. Perkins Pick (*r*)	408		

Council.

Fellows.

ELECTED.

T. E. Collcutt (*a*)	575	E. A. Gruning (*a*)	376
Ernest George (*a*)	509	G. H. Fellowes Prynne (*a*)	368
John Slater (*a*)	452	J. W. Simpson (*a*)	360
Beresford Pite (*a*)	423	J. S. Gibson (*r*)	317
E. W. Mountford (*a*)	417	C. Harrison Townsend (*a*)	303
J. A. Gotch (*a*)	416	A. W. S. Cross (*r*)	305
Paul Waterhouse (*a*)	402	W. H. Atkin Berry (*a*)	288
W. D. Caröe (*a*)	401	E. Woodthorpe (*r*)	276
A. N. Prentice (*a*)	393		
J. J. Burnet (*a*)	386		

NOT ELECTED.

E. Wimperis (*a*)	274	E. M. Gibbs (*r*)	214
F. T. Baggallay (*a*)	271	W. H. Seth-Smith	209
John Bilson (*a*)	265	Herbert Davis (*r*)	198
George Hubbard (*r*)	260	R. F. Vallance (*r*)	178
J. W. Beaumont (*r*)	254	C. E. Mallows	172
W. Gilbee Scott (*r*)	245	J. D. Matthews	163
Max Clarke (*r*)	243	W. A. Pite	147
W. Flockhart	238	H. D. Searles-Wood	127
Lewis Solomon (*r*)	235	S. B. Russell	107
John Murray (*r*)	232	H. H. Wigglesworth	98
F. R. Farrow (*r*)	223	R. Stephen Ayling	42
Maurice B. Adams	214		

Associates.

ELECTED.

R. S. Balfour (*a*)	702	H. V. Lanchester	492
W. A. Forsyth (*a*)	509	H. A. Crouch (*a*)	476

NOT ELECTED.

T. E. Pryce (*a*)	422	G. A. T. Middleton (*r*)	247
H. W. Wills (*r*)	377	H. H. Langston	164
C. E. Hutchinson (*r*)	369	E. A. Young	143

Representatives of Allied Societies.

ELECTED.

A. W. Brewill
G. B. Bulmer
Thomas Cooper
H. L. Goddard
John Keppie
W. M. Mitchell
G. H. Oatley
P. C. Thicknesse
J. H. Woodhouse

NOT ELECTED.

J. T. Cackett
J. H. Phillips
B. Priestley Shires
H. O. Tarbolton

Representative of the Architectural Association.

E. Guy Dawber.

Hon. Secretary.

Alexander Graham.

New Fellows and Associates.

The following were elected (of London where not otherwise stated):—

Fellows.

S. D. Adshead
R. Frank Atkinson
H. Beswick (county architect for Cheshire)
J. Priestley Briggs
G. T. Brown (Sunderland)
R. T. Conder (Buenos Aires)
F. L. Conder (Buenos Aires)
H. C. Corlette
Alfred Cox
J. B. Dunn (Edinburgh)
R. Evans, junr. (Nottingham)
W. J. Gilliland (president, Ulster Society of Architects)
F. T. W. Goldsmith
E. J. Gosling
A. E. Heazell (Nottingham)
O. C. Hills
J. Hudson
J. Hunt
A. T. Hussell (Ilfracombe)
R. M. Lucas (Southampton)
F. W. Marks
J. H. Martindale (Carlisle)
Glendinning Moxham (Swansea)
Sir C. A. Nicholson
F. W. Peel
J. C. Perkin
W. Pywell
C. H. Rew (Great Berkhamsted)
E. J. Sadgrove
T. A. Sladdin (Cape Town).
F. A. Smith
Prof. R. Elsey Smith
H. Teather (Cardiff)
F. Wallen
W. Williamson (Kirkcaldy)
W. Woodward
A. B. Yeates

Associate.

C. T. Palmer.

Hon. Associates.

E. A. Abbey, R.A.
W. Goscombe John, A.R.A.

Hon. Corresponding Members.

Don José Urioste y Velada (Madrid).
H. Paul Nénot (Paris).

Discussion on Competitions.

The discussion was resumed on the Institute paper on the conduct of architectural competitions as revised by the Competitions Committee (see p. 255 of our issue for May 10th). Mr. C. E. Hutchinson had proposed that the Council should be associated with the president in advising promoters as to their appointment of assessors, and Mr. George Hubbard had moved an amendment that the matter be referred back to the Competitions Committee. Both these amendments were negatived. Mr. Horace T. Bonner brought forward the following motion:—"That in the event of the president or council being applied to by promoters of competitions to nominate competing architects, notice of such application shall be published in the Institute Journal, and members of the R.I.B.A. who are willing to take part in such competitions be invited to send in their names for selection by ballot as competitors." This was not carried.

IN THE REIGN OF KING BEL-CHAW.

The Fribites, the Aribites and the Other Ites.

[*The following document in reference to the elections has been circulated during the past week.*]

NOW it came to pass, in the first year of King Bel-Chaw's reign, that there was great dissension amongst the Fribites and Aribites, who together formed the tribe of Ribites, concerning a new doctrine.

These leaders did not fight themselves and besought others not to fight, counselling moderation, as the old are wont to do.

But behind them were younger men, with hotter blood, who said, "We *will* fight; we are the salt of the earth; we are valiant and to be trusted; we can blow trumpets."

And they called themselves the "Edukatites," and did carry blue books and wear a blue ribbon.

And the other side did call themselves the "Registratites." They carried no books, only a long roll on which to inscribe names.

They had no leaders, only a "Kommittee"; although who did make them a Kommittee none did know.

And they had a Sekkretary, a Scot named Gilbey, famous for his whines.

And an Under-Sekkretary.

And there were yet others, who did sit on a fence and fear greatly lest they should fall down on either side.

And them men called "Hedgites."

Some of them did write circulars, and did post them, which must have caused them great expense.

And the small but powerful neighbouring tribe, the "Memorialites" (who will not eat or intermarry with the Ribites), did laugh in their sleeve, saying, "We did tell you so"—which is their motto.

And the cloud that had been no larger than "the mere handful"—for by such name was called the small tribe of "Societites" owing to its insignificance—grew and grew, and hung heavy on the minds of all the people, like unto a huge Komppy-tition: although some did find self-advertisement in it, and did derive strange pleasure from writing to the papers and seeing their words printed therein.

Such men read not one another's letters, only each, his own.

And the wives read their husbands' letters, but not those of the husbands of other wives.

And the Inland Revenue (stamp department) alone benefited.

Now in the twelfth month of the first year of King Bel-Chaw's reign came the great festival of the tribe known as "The Elekktion."

For by the laws of the Ribites it is ordained that if any dispute shall arise amongst them, such dispute shall be settled not by recourse to arms, nor by verbal warfare in the arena, but by votes.

And each member of the tribe, Aribite as well as Fribite, has a vote, which he must not sell, but must give away.

And as many of the Ribites live in far-off lands, because of the great expense and loss of time which journey to the chief city would entail—to say nothing of the difficulties which some of the Provincialites, as they are called, experience in making themselves understood in the chief city, owing to the strange language they do speak—it is further ordained that each Ribite, whether he live in the chief city or in the country, must send his vote by post, not by hand, neither must he give it by word of mouth.

And because many of the Ribites cannot write, no man must write anything on the voting paper, but must merely put his mark; although he, or his assistant, must write his name on the envelope containing such paper.

On the fifth day of the month, which is the day of election, the Great Kouncil Chamber was filléd.

And the Skrutineers—men chosen to count the votes, because of their great great skill in Arithmetick—stood before the King, and did bow their heads to him.

And when the people saw the Skrutineers, and the sealéd paper which they did offer to the King, there fell upon them a great silence, so that a drawing-pin could have been heard to fall.

The rest of the document contains merely the names of those elected, and is without interest. (TRANSLATOR.)

IN PARLIAMENT.

(By Our Press Gallery Representative.)

THE following are some of the enquiries addressed to ministers in the House of Commons during the last few days.

The New Mall.

Sir Henry Fowler asked Lord Balcarres when the new Mall would be opened through to Charing Cross.

Lord Balcarres replied that the First Commissioner of Works regretted that he was unable to fix any date for the opening of the Mall into Charing Cross. It must entirely depend upon the completion of the buildings at that end of the Mall.

Statues in Westminster Hall.

Mr. Lyall asked Lord Balcarres when the statues now in Westminster Hall were erected, and whether in view of the historic associations of the building some more suitable site for them would be found.

Lord Balcarres replied that the statues were erected between 1866 and 1871 under circumstances explained in the House of Commons Sessional Papers of 1868. The First Commissioner feared that he could not give any pledge to find another site for them, but he would consider the matter.

Select Committee on Fires in Factories.

Sir A. Acland-Hood stated in reply to a question by Mr. Tennant that he hoped to be able to set up the Select Committee to enquire into the means of prevention of and escape from fire in factories, workshops, shops, warehouses and composite buildings, prior to the Whitsuntide adjournment.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Fire Clause in L.B.A. Amendment Bill.

CATFORD.—T. E. S. writes: "Please explain the exact meaning of the appended clause from the London Building Acts Amendment Bill:—

'Where an imaginary line 30ft. drawn from any point in the plane of any existing opening in any external wall of any building, and in the direction of any intended window in any external wall of a building of a warehouse class (being a new building), and inclined to the aforesaid plane at any angle not exceeding 135 degs., would touch or intersect the plane of such intended window at any point therein, such window shall be glazed with fire-resisting glazing and be set in frames of fire-resisting material, and shall be so constructed that some portion of such window will afford easy access for firemen into the building in which the window is constructed.'"

The wording of the clause is most involved. Apparently what is meant is that a warehouse window must be rendered fire-resisting if it is within 30ft. of any existing opening, the distance being measured in any direction within an angle of 135 degs.

R.I.B.A. Examinations.

WALLINGTON.—G. H. writes: "I shall be glad of any information with regard to the R.I.B.A. examination. Is it necessary to be articled? I have had a good deal to do with architectural work, and would like if possible to qualify."

It is not necessary to be articled in order to become an Associate of the Royal Institute of British Architects. The only tests are the examinations. Full particulars of conditions can be obtained from the R.I.B.A. Kalendar, published at No. 9, Conduit Street, London, W.

Houses on Building Plots.

WALTON-ON-THAMES.—CONSTANT READER writes: "I have been selling plots of land for building, and have stipulated that houses are to be built of not less value than £225 nett and that bay windows are not to project more than 3ft. 6ins. from the face. Can shops be built under this condition? I did not say they were not to build shops. I mentioned only houses and bays. Are the houses shops or not?"

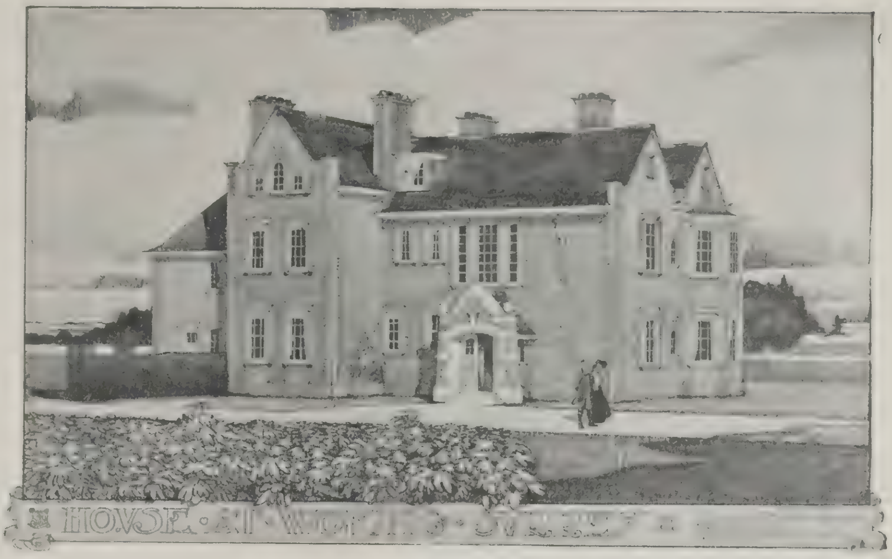
If you have clearly and distinctly embodied in the conveyance or sale contract the fact that houses *only* are to be built upon the plots, you are quite within your rights in insisting that a shop shall not be erected. A "shop" is *not* a "house." You should at once consult your solicitor upon the matter, giving him your copy of the contract and all details germane to the particular case.

F. S. I.

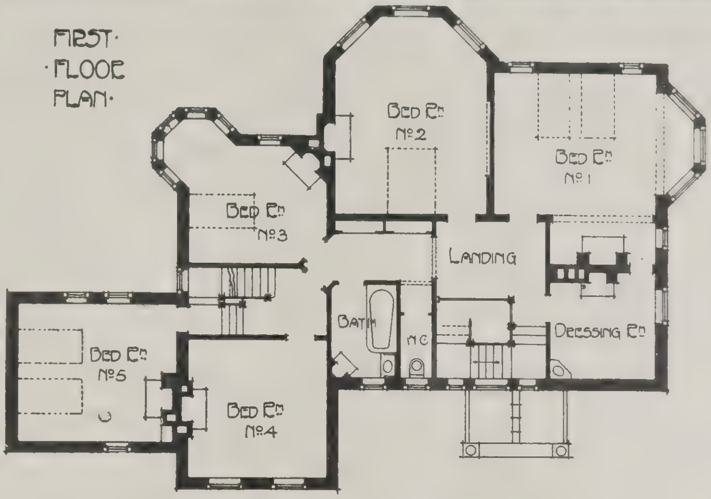
Drainage of Site.

LONDON.—M. N. writes: "Which is the best way to drain the site of a house which consists of very fine sand with water only 3ft. from the surface? Will field pipes (unglazed) with collars admit the water and at the same time keep out the sand, or will they rapidly choke?"

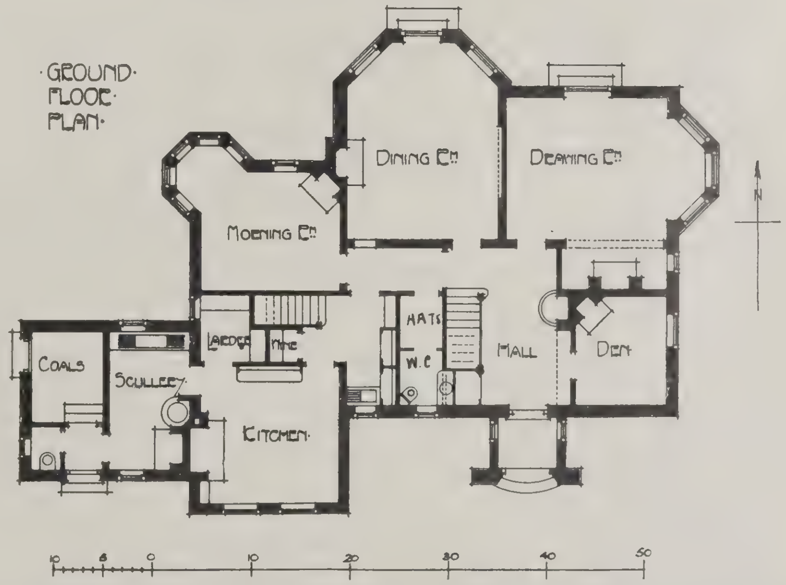
The enquiry hardly gives sufficient data to state an opinion. No general particulars are given whether the site lies high or low, on a slope, on the top of a hill, or in a valley; whether there is a convenient ditch or water-course to drain into; whether there are springs; the nature of the subsoil, &c., &c. It might be necessary to cut trenches round the site 4ft. or 5ft. deep, to lower the water level. We can only give general advice. Lay 4in. collar field pipes from 8ft. to 15ft. apart, with a slight fall and at a depth of 4ft.; these to discharge into a 6in. main drain emptying into some convenient water-course, the outfall pipe to be of iron, set at a height above the possibility of choking by floods, held up by a concrete wall, and either fitted with a flap valve or a cage to prevent the ingress of birds or vermin. The covering of the pipes will need careful attention – a first thick layer of straw or fine heather, covered with 18ins. of pea gravel of even size (not large and small stones), or a covering of sods, is advisable. As the effect of draining watery soils is to lower the ground, it might be necessary to make the minor drains a little deeper than 4ft. The subsoil drains in all cases should be put in at least a few weeks before the foundations. In addition we should advise 4ins. of Portland-cement concrete all over the site. These precautions might be excessive if we knew the site better; but without that knowledge we could not advise less.



FIRST· ·FLOOR PLAN·



·GROUND· FLOOR· PLAN·



This house is placed at the extreme northern end of the site, so that the reception-rooms may face due south and have the full advantage of the garden, with a fine view of country. The materials used are Crowborough purple brick facings with red brick and stone dressings for the walls, and red tiles for the roof. The architects were Messrs. Thomson & Pomeroy, of 49, Hill Road, Wimbledon, and the contractors Messrs. Harris & Son, of High Street, Woking.

THE TIMBER TRADE.

London Market in May.

MESSRS. CHURCHILL & SIM report that there has been little change in the London wood trade during May. It has continued to be characterized by a small consumption, a moderate importation and a low level of prices. About 500 standards more have been delivered from the docks in the month than was the case in May last year, but the Whitsuntide holidays fell in May in 1904, and will have to be this year deducted from the consuming power of the month. Until these dock deliveries show more improvement than this there cannot be much hope of a rise in prices. When they do, if the importation continues small, as there is every prospect that it will at present, the effect on the existing level of price should be immediate. In the foreign markets prices for summer supplies have varied little in May. Russian shippers have done no wholesale business, and for the small sales effected have reduced their rates only slightly, so that they are still above the corresponding quotations of their Swedish competitors. Swedish shippers accordingly are more inclined to hold, here and there, for something over the lowest rates that have been accepted earlier; but they too have done only small business in the month. Freights continue cheap and plentiful enough, but if anything, the rates have tended slightly to harden since April.

Messrs. Denny, Mott & Dickson, Ltd., state that if there was no great improvement in the demand during May, the consumption was consistently steady, and business was of a soundly satisfactory character in all departments of the timber trade. Prices for fresh stocks continue to harden, and even last year's stocks are ceasing to be a further source of anxiety to holders, as they have assumed moderate proportions and been sufficiently written down to promise some profit—now that the signs of gradually improving general trade are becoming unmistakable, whilst the clearing of the political atmosphere by the just assured Japanese naval dominancy in the East should increase general confidence and lead to a peace which will make for good trade.

The abstract of stock, consumption, &c., for May, published by Messrs. Foy, Morgan & Co., is given in the table at the foot of this page.

Dock Stock.

The stock of wood in the public docks on May 31st was:—

	Pieces.
Foreign deals and ends	858,000
Do. battens	1,459,000
Pine deals and battens	905,000
Spruce do. do.	624,000
Boards, rough	2,545,000
Do. prepared	6,021,000

Totalling 12,412,000 pieces, as compared with 14,333,000 in 1904, 14,254,000 in 1903, and 13,330,000 in 1902.

In other kinds the stock was as follows:—

Foreign wainscot logs	172 pieces.
Do oak timber	594 loads.
Do. fir timber	169 do.
Do. Oregon pine, &c., spars and masts	4,107 do.
Colonial oak timber	1,346 loads.
Do. birch timber and planks	1,363 do.
Do. elm and ash timber	552 do.
Do. yellow pine	252 do.
Do red pine	177 do.
United States pitch-pine timber	14,952 do.
Do. do. deals	50,000 pieces.
East India teak	7,921 loads.

The deliveries for the first five months

have been of—

	Pieces.
Foreign deals and ends	1,391,000
Do. battens	2,610,000
Pine deals and battens	477,000
Spruce do. do.	687,000
Boards, rough	2,590,000
Do. prepared	6,541,000

Totalling 14,296,000 pieces, as compared with 15,584,000 in 1904, 16,600,000 in 1903, and 17,289,000 in 1902.

The deliveries for May

were as follows:—

	Pieces.
Foreign deals and ends	280,000
Do. battens	575,000
Pine deals and battens	102,000
Spruce do do	157,000
Boards, rough	440,000
Do. prepared	1,566,000

Totalling 3,120,000 pieces, as compared with 2,970,000 in 1904, 3,100,000 in 1903, and 3,403,000 in 1902.

Deliveries from Ship to Craft.

The deliveries direct from ship to craft for the first five months of the year have been:—

	1905.	1904.	1903.	1902.
	P.s.h.	P.s.h.	P.s.h.	P.s.h.
Deals and battens	16,038	15,486	21,526	14,104
Boards	5,985	4,832	7,267	6,776
Total	22,023	20,318	28,793	20,880

and for May—

	P.s.h.	P.s.h.	P.s.h.	P.s.h.
Deals and battens	7,920	7,829	13,229	7,757
Boards	2,221	1,567	2,922	1,390
Total	10,141	9,396	16,151	9,147

Soft Woods.

Swedish Wood.—Messrs. Churchill & Sim report that the importation for May has been slightly in excess of that for May last year, but nevertheless on a small scale. Both deals and battens, old stock principally, have been sold at rates which compared not unfavourably with those current here in April, but the demand has been of a very retail nature. Prices for flooring have drooped during the month, even below those submitted to in April, again from lack of power in the demand.

Norwegian Boards.—The arrivals of prepared boards from the Norwegian ports during May have been very scanty; not much more than half those of May, 1904 They have, however, amply supplied the feeble wants of the market, and prices are certainly no better than they were a month ago.

Russian Deals and Battens.—The market has cleared up a fair quantity of last year's importation during May, and prices for deals, and still more so for battens, have tended to firmness in the absence of any considerable break in free-on-board quotations for further shipments.

Finnish Battens.—There has been a tendency towards improvement in the prices for all small Finnish battens in the London market during May. Probabilities still point to a light supply, and with any improvement in the consumption this tendency should be easily maintained.

Prussian Timber.—The fresh supply of fir timber has been a very light one, and the dock stock appears to amount to the magnificent total of 169 loads, so that there can be no London market price, Of oak also the supply has been inadequate even for a retail consumption, and prices are firmer.

Canadian Timber.—Prices for pine deals continue weak in London, at perhaps a point below those to which they were reduced in April. The demand has slacked off again. For spruce there is no change in the London market. The St. Lawrence shipments continue to be sold for arrival in small quantity at moderate prices, while from the Lower Ports it is becoming more, rather than less, difficult to make forward sales at the comparatively high rates asked, rates to which the London market has never made any attempt to respond. In hardwoods the demand for oak and birch timber has been quite unsatisfactory. There is no change in the quotations for elm and ash, or for yellow pine timber.

The fresh supplies of sawn timber in the month are almost nil, and the effect of a good consumption is shown in a plentiful reduction of the dock stock. This has not, however, had any particular effect on prices, which so far cannot be said to be more than a point better than in April. Of pitch-pine deals the supply has been quite nil during the month, and these stocks also show free reduction. The effect on prices, moreover, has in this case been more marked, and there is a distinct rebound from the excessive depression of the earlier months of the year.

Hardwoods.

Teak.—Messrs. Denny, Mott & Dickson, Ltd., report that the landings in the docks in London during May consisted of 1,320 loads of logs and 145 loads of planks and scantlings, or a total of 1,465 loads, as against 1,107 loads for the corresponding month of last year. The deliveries into consumption were 301 loads of logs and 260 loads of planks and scantlings—together 561 loads, as against 383 loads for May, 1904. The difficulties of getting supplies continue, and although a Moulmein cargo of logs has been a welcome addition to the depleted stocks, it consisted entirely of short logs, and a considerable portion of these were sold to consumers long before arrival, so that the increase in the dock figures is transient. Very long prices are required for such stocks as may still remain at the shipping ports, and large supplies are quite unobtainable. Prices, therefore, are reaching a figure quite unprecedented; and although this is to be regretted, it must be recognized that shippers have had to suffer in the volume of their trade by the scarcity of the outget from the forests, and have naturally found compensation in marketing such supplies as they have at high prices.

Mahogany.—This market has been very lifeless. The lack of volume in the demand has counteracted the effect of the moderate supplies from Honduras, the season for this description of wood having practically closed.

Odessa Oak.—The shipments of logs which have recently come forward have been of a very prime character, and given great satisfaction to large consumers who find such wood most economical for high-class constructive work. As the market continues to widen out, prices have tended upwards; but the chief shippers of this wood are wisely content with getting a small return on the actual cost of production, so that their product may continue to be comparatively cheap as against other descriptions of oak.

ABSTRACT OF STOCK, CONSUMPTION, &C., FOR MAY.

S.C. Dks. and M. Dks.	Deals (Fir).	Battens (Fir).	Pine.	Spruce.	Pitch-pine Deals.	Deals and Battens in Aggregate.	Rough Boards (All Countries).	Flooring.	Floated Timber.
	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Loads.
Public dock stock	731,803	1,534,713	905,107	624,570	50,760	3,846,953	2,545,200	6,020,867	20,000
Monthly public dock consumption	238,805	597,715	100,139	155,214	8,637	1,100,510	444,446	1,543,867	3,433
Overside stock	—	—	—	—	—	—	—	—	—
Overside consumption (estimated of dock):—									
82 per cent. Sawn 55 ,, Planed	195,820	490,126	82,114	127,275	—	895,335	364,446	849,127	—
Duration of supply at same rate of consumption	1·68 months.	1·41 months.	4·97 months.	2·21 months.	5·88 months.	1·93 months.	3·15 months.	2·52 months.	5·83 months.

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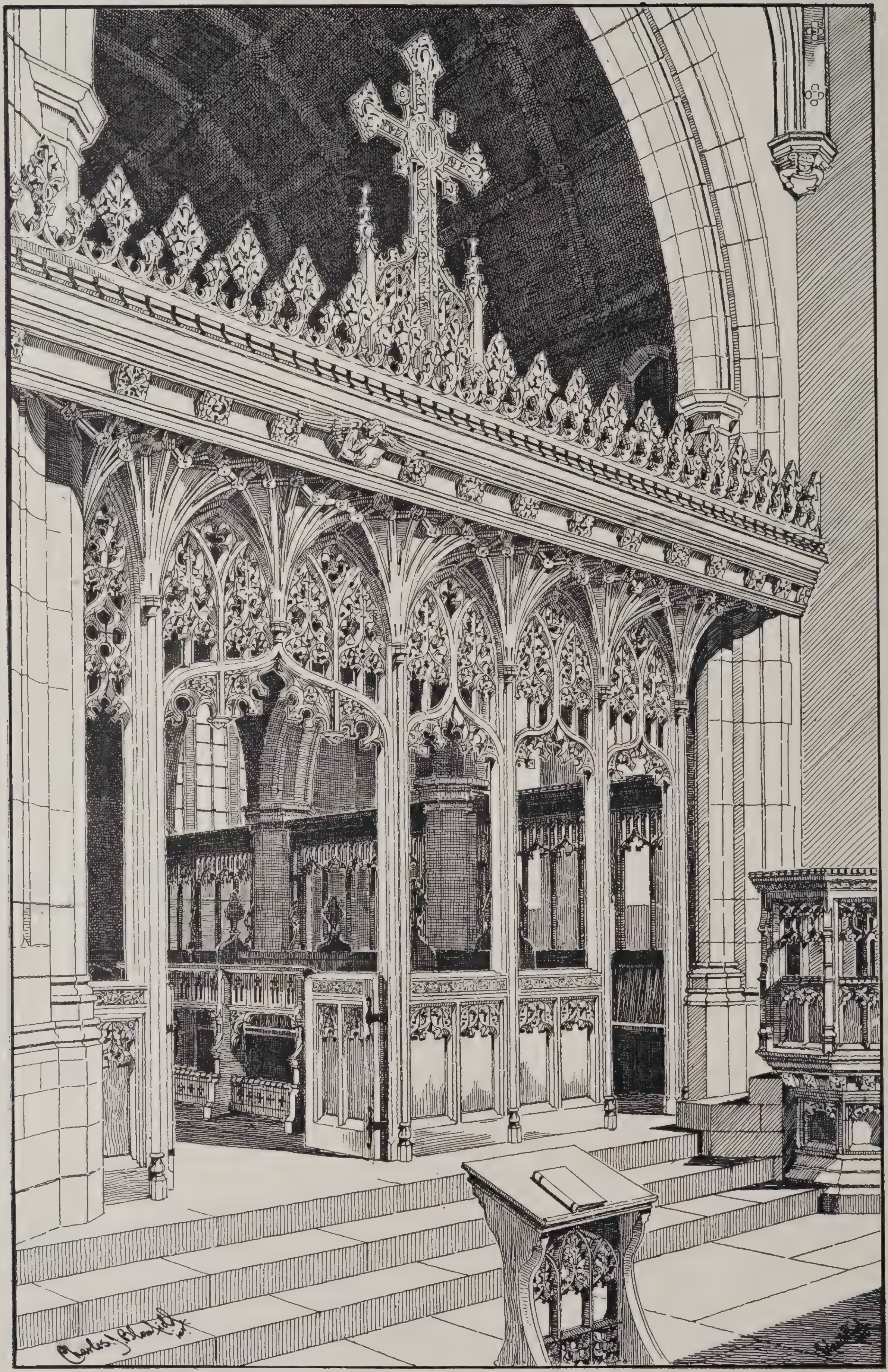
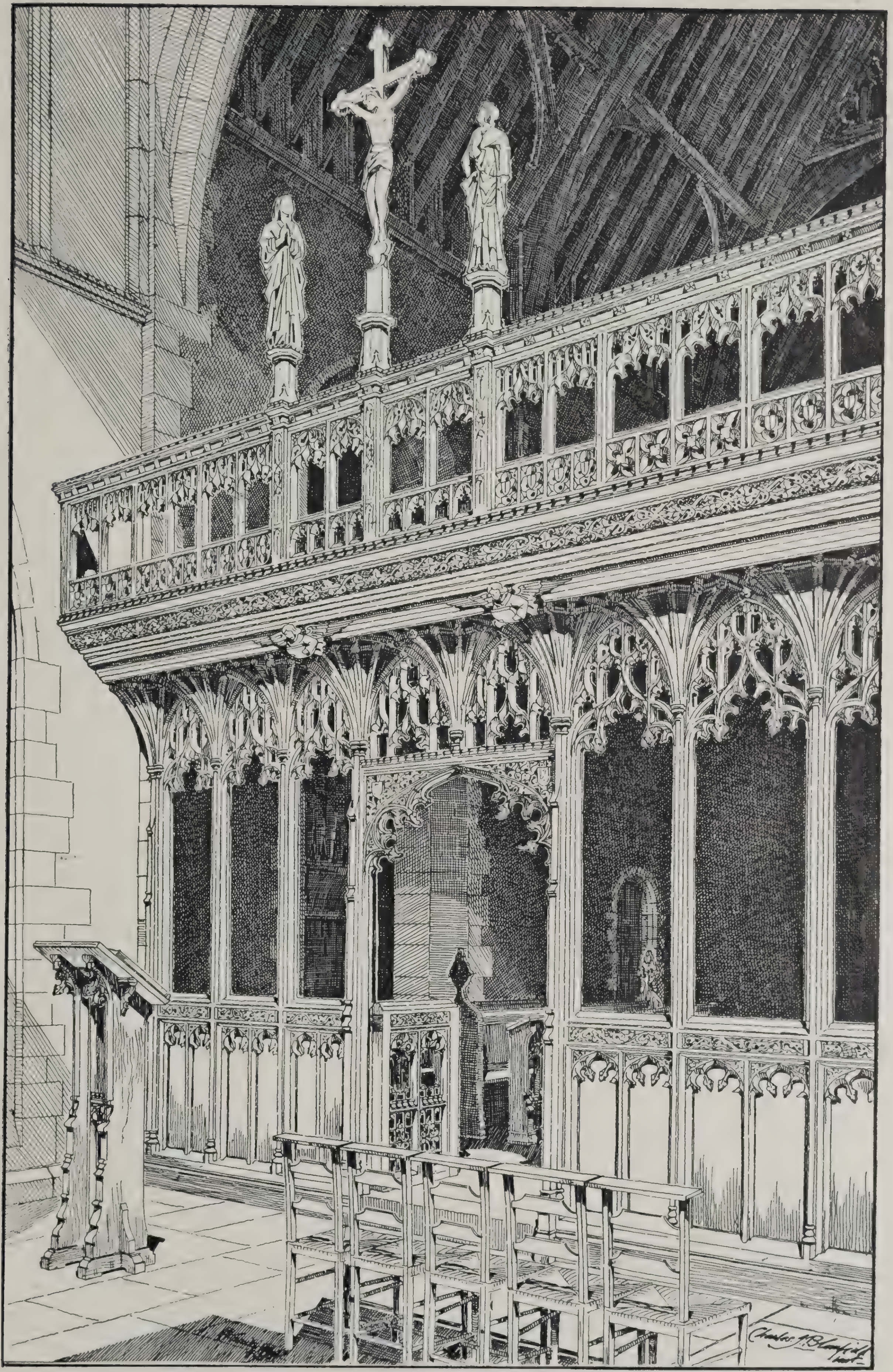
Supplement to
The Builders' Journal and Architectural Record,
Wednesday, June 7th, 1905.


Charles J. Blomfield del.

Rood Screen at Aldenham Church, Herts.

Charles J. Blomfie


Charles J. Blomfield del.

Rood Screen at Swaffham Prior Church, Cambs. (*Royal Academy Exhibition*, 1905.)

B.A., ARCHITECT.

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Builders' Notes.

London Building Act Amendment Bill.—It was originally decided that the Corporation, he Metropolitan boroughs and the various rofessional and other authorities concerned hould submit their observations on the Bill y June 10th. An extension of time, to uly 10th, has now been granted. In hese circumstances it is not likely the Bill vill be introduced in the next session of arliament.

Cheap Houses.—The Local Government oard has granted permission to the Staines ural Council to pass the following by-laws vith respect to the erection of cheap dwellngs:—

(1) All rooms in buildings to be used as shops or dwellngs to be 8ft. high, with the exception of rooms contructed wholly or partially in the roof, which should ave a height of 5ft. from the floor at the sides and 8ft. ver one-half of the floor.

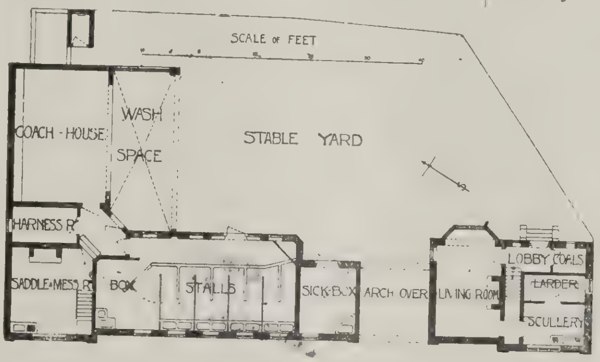
(2) Any building comprising not more than one storey o be constructed of, or wholly covered with, galvanized orrugated or other sheet iron, and the interior to be overed with fireproof lining.

Tyneside Building Trade Dispute: Joiners ccept a Reduction.—The joiners employed n the building trade on Tyneside, following he lead given by the operative masons, have ccepted a reduction in their wages of ½d. er hour, making the rate 9½d., with minor lterations in their working rules. The brickayers and plasterers still appear to be firm n their determination not to begin work xcept at previous rates of pay, but it is nticipated that a settlement will be effected vith the labourers on the basis of ¼d. per our reduction.

Spencer, Santo & Co.—The report for 1904 ates that the nett income, including the mount brought forward, was £20,966. It is roposed to pay a dividend at the rate of 5 per cent. per annum on the ordinary ares, making 10 per cent. for the year, arrying forward £1,193. This distribution at the same rate as last year. The directors onsider it satisfactory that, in spite of the eneral depression in the building trade, the ompany is in a position to maintain its dividend. Continued satisfactory progress has been made with the new public offices at Westminster. The company has just secured a large building site in an important thoroughfare in the West End, whereon it is proposed to erect business premises. The directors confidently anticipate that this venture will prove a highly remunerative one.

The Transporter Bridge across the Mersey, between the towns of Widnes and Runcorn, was opened last week by Sir John Brunner.

Irish Slates.—Referring to the use of Irish or Westmorland slates at school buildings at Glasnevin for the Commissioners of National Education in Ireland—a question in regard to which was asked recently in the House of Commons (as reported on p. 303 of our issue for last week)—a correspondent of the "Freeman's Journal," Dublin, says: "I have before me a price-list of a Westmorland slate company, and I compute that the slates which are commonly used here by builders would cost about 50s. per square of 100ft. super. landed at the North Wall, and the cost of fixing these on the roof would be about 12s. per square. I have also a price-list of an Irish quarry before me, and the price per square works out at about 35s. on rail, Dublin, and the price of fixing at about 6s. The difference between the two is 21s. per square in favour of the home article."



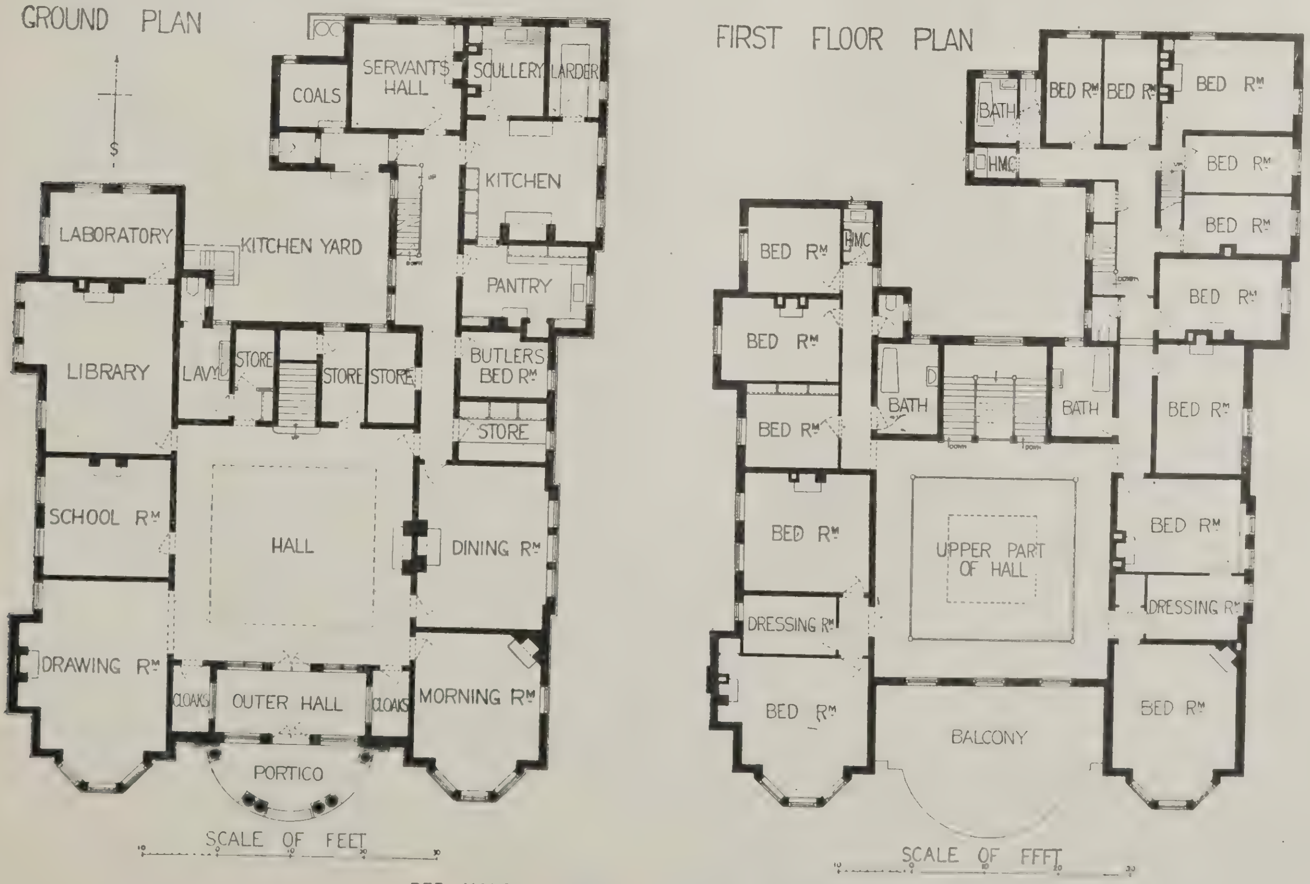
THE STABLES.

RED HOUSE, CHAPEL ALLERTON.

In the design of this house, near Leeds, of which we give plans and photographs herewith, a large hall with top-light was required, suitable for the display of a collection of prints upon the walls, with a number of small sitting-rooms opening off the hall. A gallery runs round the hall at first-floor level, but care has been taken to avoid making any of the bedroom doors to open direct from this gallery. Externally the house is built of axe-faced Hopton Wood stone for the plinth, and above with 1¾in. Woodville sand-faced bricks supplied by Messrs. Ellis, Partridge & Co., of Leicester, with Ancaster stone dressings. The cornice is of wood, painted white, while the roof is slated with "Arfon" American red slates, supplied by Messrs. Pearson Brothers & Campbell, of Liverpool. The columns of the portico are also of Hopton Wood stone treated with a "pecked" face, and the hall mantelpiece is made of various-coloured Derbyshire marbles from Messrs. Killer Brothers' quarries. The contractors were:—W. Thompson & Sons, mason and bricklayer; Banks Mawson, joiner; J. Lindley, plumber; T. Moore, plasterer; Watson & Worsnop, slater; and Roylance & Horsman, painters. The stable fittings were supplied by the St. Pancras Ironwork Co., Ltd. Messrs. F. W. Bedford and Sydney D. Kitson were the architects.

OUR PLATES.

The rood screens at Aldenham Church, Herts, and Swaffham Prior Church, Cambs, have been recently erected (in oak) from designs by Mr. Charles J. Blomfield, F.R.I.B.A. In both cases the ancient approach and doorway to the rood lofts are in existence. The screen for Aldenham Church was carried out by Messrs. J. Thompson & Co., of Peterborough, and that for Swaffham Prior Church by Messrs. Cornish & Gaymer, of North Walsham.



RED HOUSE CHAPEL ALLERTON, LEEDS.

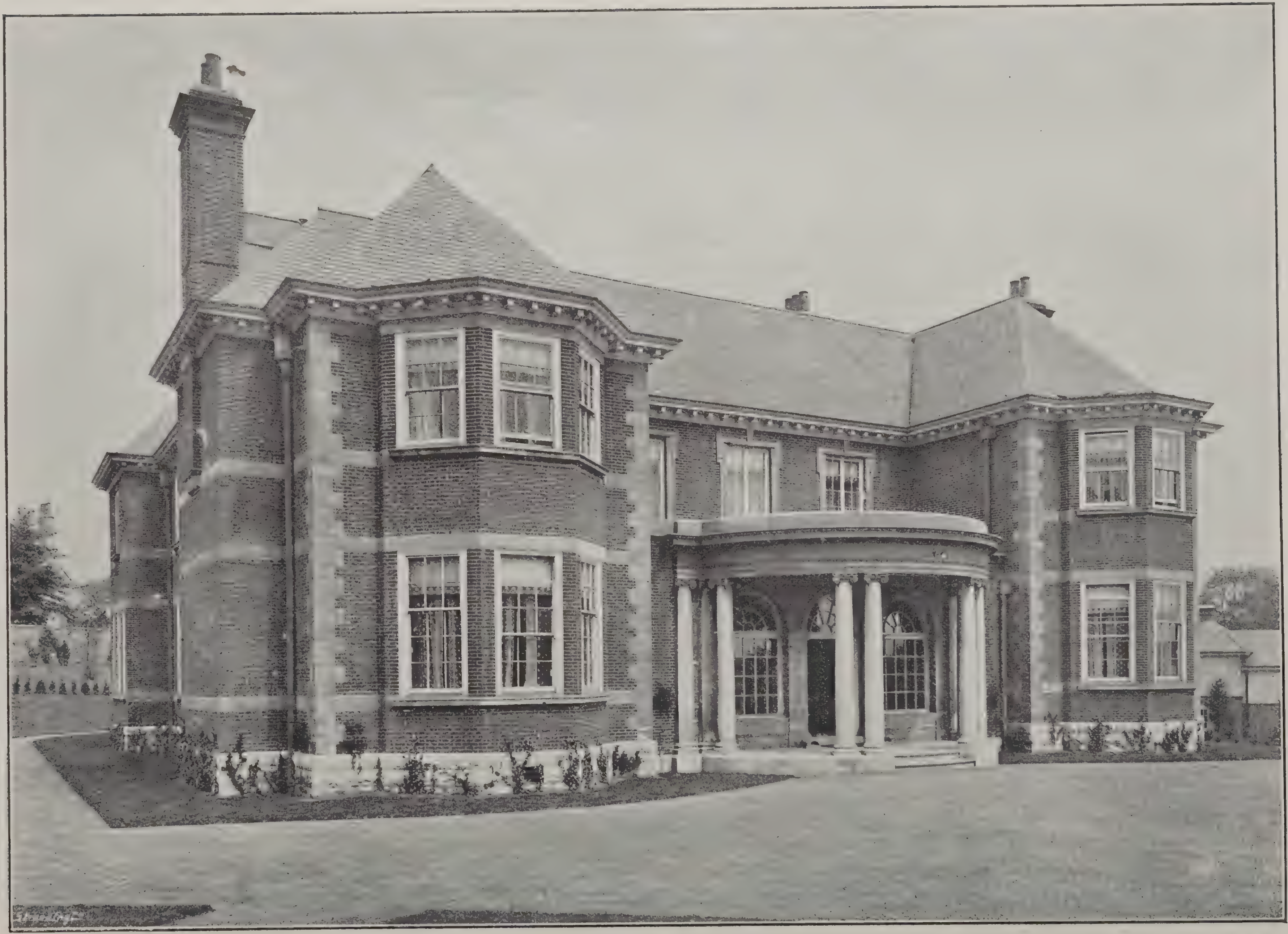


Photo: C. H. R. Pickard.

RED HOUSE, CHAPEL ALLERTON, LEEDS. FRANCIS W. BEDFORD AND SYDNEY D. KITSON ARCHITECTS.

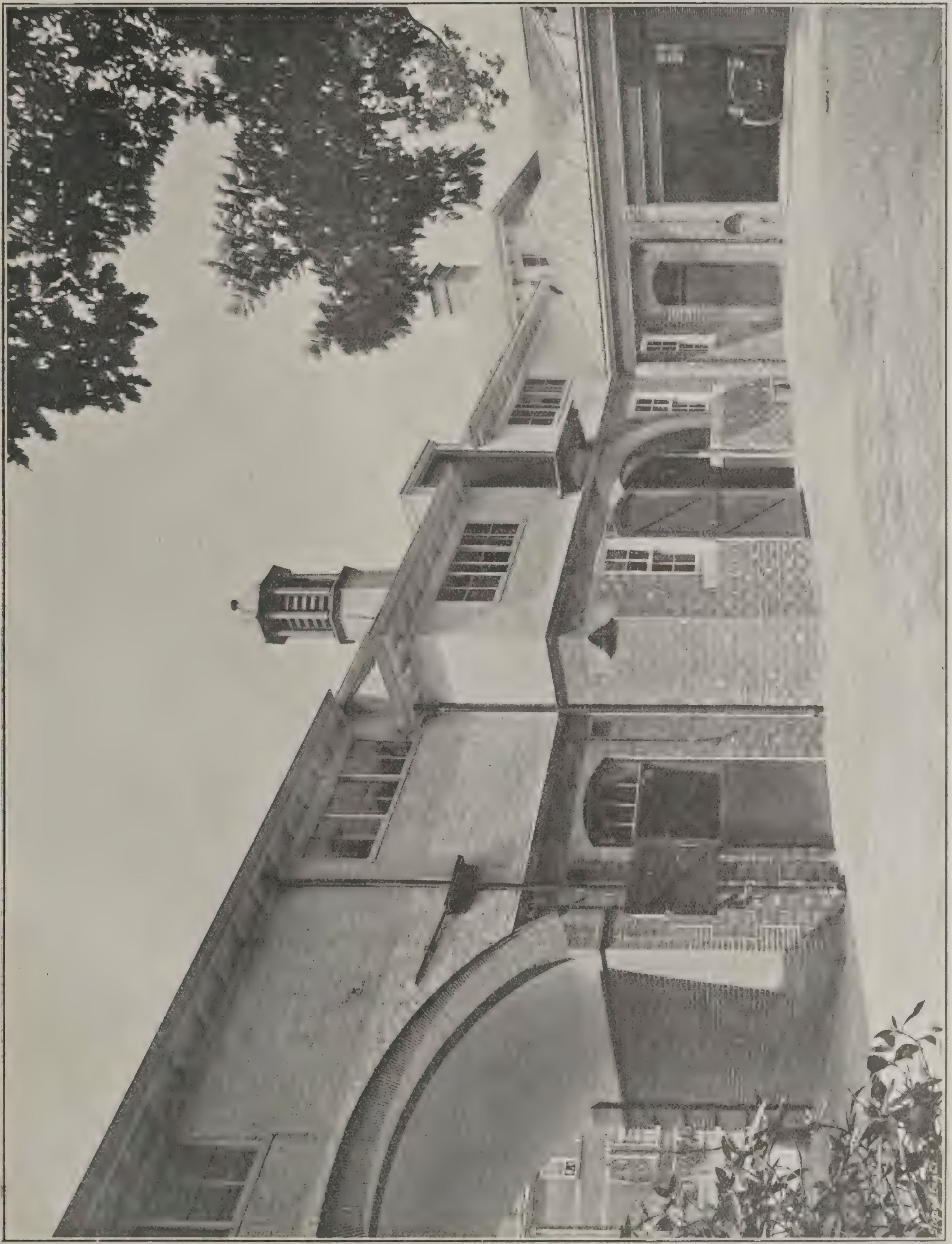


Photo: C. H. R. Pickard.

THE STABLES RED HOUSE, CHAPEL ALLERTON LEEDS. FRANCIS W. BEDFORD AND SYDNEY D. KITSON, ARCHITECTS.

Complete List of Contracts Open.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		BUILDING:		
June	8	Weaverham, Cheshire—Alterations, &c., to School	Sub-Committee	H. Beswick, Newgate Street, Chester.
,,	8	Sheffield—Training College	Education Committee	Gibbs & Flockton, 15 St. James's Row, Sheffield.
,,	8	Alnwick—Works executed at Workhouse	———	Workhouse, Alnwick.
,,	8	Donisthorpe—Schoolroom	Committee	C. R. Ross, York Chambers, Long Eaton.
,,	8	Halifax—Alterations at Hall	Friendly and Trades' Societies	T. Kershaw, L. and Y. Bank Chambers, Halifax.
,,	8	Weaverham, Cheshire—Alterations to School Buildings	Administrative Sub-Committee	H. Beswick, Newgate Street, Chester.
,,	8	Donisthorpe—New School and Classrooms	Committee	C. R. Ross, York Chambers, Long Eaton.
,,	9	Shepshed—Enlarging Sunday Schools	———	W. T. Hampton, Ashby Road, Loughborough.
,,	9	Westborough, Dewsbury—Three Terrace Houses	———	J. Firth & Son, 67 Vulcan Road, Dewsbury.
,,	9	Mexborough, near Rotherham—Classrooms	Education Committee	County Hall, Wakefield.
,,	10	Newcastle-on-Tyne—Boiler-house	Guardians	Newcombe & Newcombe, 89 Pilgrim Street, Newcastle-on-Tyne.
,,	10	Penygroes, Wales—Chapel	———	W. Wilkins, Llanelly.
,,	10	Ashton-under-Lyne—House	———	T. George & Son, 7 Warrington Street, Ashton-under-Lyne.
,,	10	Brockhills, near Totnes—Farm Buildings	Sir Robert Harvey	Bourne & Son, Surveyors, Totnes.
,,	10	Bickington, near Newton Abbot—Partial Rebuilding of Stable, &c.	———	Mr. Colman, Love Lane Farm, Bickington.
,,	10	Bryn, Wales—Sixteen Houses	Building Club	W. A. Griffiths, Pontllanfraith, Mon.
,,	10	Llanelly—Schoolroom	———	W. Wilkins, F.S.I., Llanelly.
,,	10	Dolgelly—Additions to School	Governors	Deakin & Howard Jones, Architects, Borth.
,,	12	Croydon—Cottage Homes	Guardians	J. H. Smith, 41 Moorgate Station Buildings, E.C.
,,	12	London, W.—Public Offices	Acton U.D.C.	F. T. W. Millar, 2 Dartmouth Street, Westminster, S.W.
,,	12	Dundalk—School	Urban District Council	Maurice Sellars, Town Hall, Dundalk.
,,	12	Prestwick, N.B.—Enclosure Walls	Parish Council	J. & H. O. Eaglesham, 24 Wellington Square, Ayr.
,,	12	Acton, W.—Town Hall, &c.	Urban District Council	F. W. T. Miller, 2 Dartmouth Street, Westminster.
,,	13	Ancroft, Northumberland—Improvements to School	Education Committee	J. A. Bean, Moothall, Newcastle-on-Tyne.
,,	13	Burslem—School of Art	Town Council	A. R. Wood & Son, Queen Street, Burslem.
,,	13	Colchester—Engine House	Corporation	C. E. Bland, Town Hall, Colchester.
,,	13	Devizes—Dressing-rooms, &c.	Corporation	F. G. Billingham, Town Hall, Devizes.
,,	14	Newport, Mon.—Rebuilding Post Office	Commissioners	H.M. Office of Works, Storey's Gate, S.W.
,,	14	Portsmouth—Enlargement of Home	Committee	G. C. Vernon-Inkpen, 40 Commercial Road, Portsmouth.
,,	14	Gloucester—Enlargement of Post Office	Commissioners	Postmaster, George Street Office, Gloucester.
,,	14	Llwynpia, Wales—Swimming Baths	Workmen's Institute	W. B. Rees, 3 Dumfries Place, Cardiff.
,,	14	Warminster, Wilts—Fire Station	Fire Brigade	C. H. Lawton, Surveyor, Warminster.
,,	15	Wakefield—Parochial Hall Buildings	———	Mr. Simpson, Southgate Chambers, Wakefield.
,,	15	Newcastle-on-Tyne—Thirteen Houses and Three Shops	Mr. S. Kirk	10 Trafalgar Street, Newcastle-on-Tyne.
,,	16	Llangoed—Pair of Stone-built Cottages	H. A. Christy	James Cheyne, The Ley, Llyswen.
,,	17	Pershore, Worcs—Walls	Joint Burial Committee	L. E. Clayton, Bridge Street, Pershore.
,,	19	Dartford—Carsheds	Urban District Council	T. E. Tiffin, Council Offices, Dartford.
,,	19	Cromer—Storeyard Building	Urban District Council	A. F. Scott, West Street, Cromer.
,,	23	Llansantffraid, Glyn Ceiriog, Wales—Additions to School	Education Authority	Headmaster, Council School, Llansantffraid, Glyn Ceiriog
,,	24	Rhyl, North Wales—Library	Urban District Council	A. A. Goodall, Council Offices, Clwyd Street, Rhyl.
,,	26	Barry—Masonic Hall	———	J. A. Wwen, Main Street, Cadoxton, Barry.
,,	30	Willesden—Repairs to School	Education Committee	G. E. T. Lawrence, 22 Buckingham Street, Adelphi.
July	1	Prestwick, Ayr—Twelve Houses	C. W. Andrew	A. L. Mercer, Ayr.
,,	5	Prestwick, Ayr—Six Pairs of Semi-detached Cottages	Wyllie & Co.	A. L. Mercer, Ayr.
,,	6	Gainsborough—School	Education Committee	Scorer & Gamble, Bank Street Chambers, Lincoln.
		ENGINEERING:		
June	10	Cwmbran, Mon.—Tank, &c.	Gas Co., Ltd.	T. H. White, Gasworks, Cwmbran, R.S.O., Mon.
,,	10	Santander—Dredge	———	Junta del Puerto.
,,	13	Esh, Durham—Electric-lighting Plant	———	J. Lowes, Clerk, Esh.
,,	14	Gravesend—Electric Lighting	Education Committee	C. F. McInnes, Electricity Works, Gravesend.
,,	14	Petworth, Sussex—Bridge	Rural District Council	Councils Offices, Petworth.
,,	14	Ossett, Yorks—Electrical Plant	Town Council	W. Emmett, 35 Commercial Street, Halifax.
,,	14	Carshalton, Surrey—Engineering Plant	Metropolitan Asylums Board	Office of Board, Embankment, E.C.
,,	14	Radstock, Somerset—Widening Bridge	Urban District Council	Council Offices, Radstock.
,,	14	South Brent, Devon—Waterworks	Totnes R.D.C.	R. H. Worth, 42 George Street, Plymouth.
,,	14	Gravesend—Electric Lighting of Schools	Wyllie & Co.	C. F. McInnes, Electricity Works, Gravesend.
,,	15	Ribera, Sicily—Aqueduct	———	Municipality, Ribera, Sicily.
,,	15	Edinburgh—Heating Installation	Parish Council	R. M. Cameron, 53 Great King Street, Edinburgh.
,,	15	Ilford—Refuse Destructor	Urban District Council	Herbert Shaw, Town Hall, Ilford.
,,	16	Wirral, Cheshire—Sewers	Rural District Council	F. E. Priest, 13 Harrington Street, Liverpool.
,,	16	Rio de Janeiro, Brazil—Engines and Tools	———	Intendenciada Estrada de Ferro Central do Brazil.
,,	19	Brigg, Lincs—Pipe-laying	Urban District Council	A. Atkinson, Brigg.
,,	22	Cricklewood, Middlesex—Reservoir, &c.	Metropolitan Water Board	District Secretary, New River District Offices, 173 Rosebery Avenue, E.C
,,	26	Edinburgh—Inclined Retort Carbonizing Plant	Gas Commissioners	W. R. Herring, New Street Works, Edinburgh.
		IRON AND STEEL:		
June	9	Hemel Hempstead—Staircases	Guardians	Workhouse, Hemel Hempstead.
,,	13	Stockport—Hurdles, &c.	General Purposes Committee	J. Atkinson, Borough Surveyor, Stockport.
		PAINTING AND PLUMBING:		
June	3	Teddington—Painting House, &c.	Urban District Council	M. Hainsworth, Elmfield House, Teddington.
,,	5	London, E.—Re-decorating Library	Stepney Borough Council	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
,,	5	Leicester—Painting Exterior Market Hall	Markets Committee	E. G. Mowbray, Town Hall, Leicester.
,,	7	Edgware, Middlesex—Painting, &c., at Workhouse	Guardians	F. J. Seabrook, Union Office, Edgware.
,,	8	Bootle, Lancs—Painting at Schools	Corporation	Borough Engineer's Office, Town Hall, Bootle.
,,	8	Halifax—Painting Work	Friendly and Trades' Societies	T. Kershaw, L. & Y. Bank Chambers, Halifax.
,,	8	Penrhiwceiber, Wales—Paints, &c.	Navigation Colliery Co., Ltd.	Secretary, Navigation Colliery Co., Penrhiwceiber.
,,	9	Manchester—Oils, &c.	Electricity Committee	F. E. Hughes, Electricity Department, Town Hall, Manchester.
,,	10	Accringtok—Painting at Cemetery, &c.	Corporation	Borough Engineer, Town Hall, Accrington.
,,	10	Merthyr Tydfil—Painting, &c., at School	Guardians	Superintendent, Aberdare Training Homes.
,,	10	Middlesbrough—Red and White Lead, &c.	Corporation	R. V. Thompson. 42 Commercial Street, Middlesbrough.
,,	12	Bolton—Cleaning, &c., School	Education Committee	F. Wilkinson, Education Offices, Nelson Square, Bolton.
,,	13	Queensferry, Flints—Painting Steelwork, &c., of Bridge	County Council	Officers in Charge, Queensferry (Opening) Bridge.
,,	19	West Ham—Painting, &c., Schools	Education Committee	William Jacques, 2 Fen Court, E.C.
,,	19	Portsmouth—Painting, &c., Schools	Education Committee	A. H. Bone, Cambridge Junction, Portsmouth.
,,	19	Stratford, E.—Painting, &c., at School	Education Committee	W. Jacques, 2 Fen Court, E.C.
,,	21	Hull—External Painting of Fifteen Schools and White-washing Twelve.	Education Committee	Education Offices, Albion Street, Hull.
		ROADS AND CARTAGE:		
June	8	Cwmcarn, Mon.—Road Works	County Council	William Tanner, County Surveyor, Cwmcarn.
,,	8	Gravesend—Making-up Road	Corporation	Borough Surveyor's Office, Town Hall, Gravesend.
,,	8	Ogmore and Garw, Wales—Street Works	Urban District Council	H. D. Williams, Brynmenyn.
,,	10	Wakefield—Street Works	City Council	Borough Surveyor, 13 Somerset Place, Wakefield.
,,	10	Bingley, Yorks—Levelling, &c.	Urban District Council	H. Bottomley, Town Hall, Bingley.
,,	13	Haverhill, Suffolk—Granite	Urban District Council	F. W. Knewstubb, Haverhill, Suffolk.
,,	13	Swansea, South Wales—Street Works	Corporation	Borough Surveyor, 13 Somerset Place, Swansea.
,,	14	Pinner, near Hendon—Making-up Road	Rural District Council	J. A. Webb, Council's Engineer, Stanmore.
,,	14	Watford—Making-up Roads	Urban District Council	D. Waterhouse, Surveyor, Watford.
,,	14	Northfleet, Kent—Road Materials	Urban District Council	Surveyor's Department, Council Offices, The Hill, Northfleet.
,,	17	Northwood, Middlesex—Broken Granite, &c.	Urban District Council	W. L. Carr, Council Offices, Northwood, Middlesex.
,,	17	Leigh, Lancs—Granite Setts	Corporation	Tom Hunter, Bank Chambers, Leigh, Lancs.
,,	19	Preston, Lancs—Street Works	Corporation	Borough Surveyor, Town Hall, Preston.
,,	19	London, N.—Making-up Streets	Urban District Council	Engineer and Surveyor, Council Offices, Finchley, N.
,,	19	Romford—Kerbing, &c.	Rural District Council	G. Lapwood, Highway Surveyor, Victoria Road, Romford.
,,	19	York—Private Street Works	Corporation	City Engineer's Office, Guildhall, York.
		SANITARY:		
June	8	Edinburgh—Sewer	Council	Borough Engineer, City Chambers, Edinburgh.
,,	9	Scarborough—Sewer Extension	Burial Board	F. A. Tugwell, 102 Westborough, Scarborough.

Current Market Prices

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0	1	13	0
Clover, best	per load	3	15	0	4	2	6
Hay, good	do.	3	10	0	3	15	0
Sainfoin mixture ...	do.	3	10	0	3	17	6
Straw	do.	1	12	0	2	0	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ...	per cwt.	1	0	5		—	
Colza Oil, English ...	do.	1	3	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0		—	
Linseed Oil, barrels ...	per cwt.	1	0	3		—	
Petroleum, American ...	per gal.	0	0	$5\frac{1}{8}$		—	
Do. Russian ...	do.	0	0	$4\frac{3}{4}$		—	
Pitch	per barrel	0	8	0		—	
Shellac, orange	per cwt.	6	17	6	7	0	0
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	4	0	1	4	6
Tar, Stockholm	per barrel	1	6	6		—	
Turpentine	per cwt.	3	4	0		—	

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ...	per ton	79	0	0		—	
Iron, Staffs., bar ...	do.	5	15	0	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	10	0		—	
Lead, pig, Soft Foreign...	do.	12	17	6		—	
Do. do. English common brands	do.	13	2	6		—	
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14	0	0		—	
Do. pipe	do.	15	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	5	0		—	
Do. floor brads... ...	do.	9	0	0		—	
Steel, Staffs., Girders and Angles	do.	5	7	6	5	12	6
Do. do. Mild bars ...	do.	6	0	0	6	5	0
Tin, Foreign	do.	136	10	0	137	0	0
Do. English ingots ...	do.	137	0	0	139	0	0
Zinc, sheets, Silesian ...	do.	26	5	0		—	
Do. do. Vielle Montaigne	do.	26	10	0		—	
Do. Spelter	do.	23	10	0	23	17	6

TIMBER.

Soft Woods.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel	per load	2	10	0	4	15	0
Pine, Quebec, Yellow ...	do.	4	0	0	7	10	0
Do. Pitch, American	do.	2	8	0	5	0	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, Kemi Yellow, 1st & 2nd, 4×11	per std.	11	0	0		—	
Do. do. do. do. 3×9	do.	10	5	0		—	
Do. do. do. do. 2×9	do.	10	15	0		—	
Do. Soderhamn, Yellow, 4th, 4×9	do.	11	15	0		—	
Do. St. Petersburg, Yellow, 1st, 3×11	do.	16	10	0		—	
Do. Kem, Yellow, 1st, 3×9	do.	18	10	0		—	
Deals, Nederkalix, Yellow, 1st, 3×9	per load	11	15	0			
Do. Umba, Yellow, 4th, 3×9	do.	8	10	0		—	
Do. Gefle, Yellow, 3rd, 3×9	do.	11	10	0		—	
Do. Sandarne, Yellow, 5th, 2½×7	do.	8	10	0		—	
Do. Quebec and Saguenay, Spruce, 3rd, 3×9	do.	8	15	0		—	
Do. St. John, Spruce, 1st, 2nd & 3rd, unsorted ...	do.	7	10	0		—	
Battens, all kinds ...	do.	6	0	0	13	0	0
Flooring Boards 1in. prepared, 1st... ...	per square	0	10	6		—	
Do. 2nd	do.	0	8	3		—	
Do. 3rd, &c.	do.	0	6	6	0	9	6

Hard Woods.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	3	17	6	7	5	0
Birch, New Brunswick...	do.	2	10	0	5	0	0
Do. Quebec do. ...	do.	2	10	0	5	15	0
Box, Turkey	per ton	7	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	$3\frac{1}{2}$	0	0	$3\frac{1}{2}$
Do. Honduras ...	do.	0	0	$3\frac{1}{2}$		—	
Do. Tobasco	do.	0	0	$3\frac{3}{4}$		—	
Elm, Quebec	per load	4	0	0	8	10	0
Jarrah, planks	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras...	per ft. sup.	0	0	$3\frac{1}{32}$		—	
Do. Tobasco ...	do.	0	0	$4\frac{27}{32}$		—	
Do. Cuba ...	do.	0	0	$2\frac{27}{32}$		—	
Do. African ...	do.	0	0	$2\frac{29}{32}$		—	
Oak, Wainscot	per log.	3	5	0	7	5	0
Teak, Indian, logs ...	per load	10	0	0	18	15	0
Do. do. planks ...	do.	13	0	0	20	5	0
Whitewood, American, logs.	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	3	9

Coming Events.

Wednesday June 7.

INSTITUTE OF SANITARY ENGINEERS. — Election Committee at 3.30 p.m. Organizing and General Purposes Committee at 5 p.m.

BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.—Meeting at 8 p.m.

Friday, June 9.

ARCHITECTURAL ASSOCIATION CAMERA AND CYCLING CLUB.—Whitsuntide excursion to Belgium. Leave Charing Cross, 9 p.m.

Saturday, June 10.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to Falkland.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—Meeting at Newcastle-on-Tyne at 2 p.m.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending June 2nd eleven failures in the building and timber trades in England and Wales were gazetted.

C. YOUNG, road contractor, Yarlington. R.O. May 25th.

A. GALE, builder and contractor, Fleet. Adj. May 24th.

J. HARLEY & SON, builders, Smethwick. R.O. May 22nd.

W. SMITH, plumber and sanitary engineer, Smethwick. R.O. May 22nd.

J. G. PICKARD, builder and contractor, Turner's Hill. Adj. May 26th.

J. BOWSER, builder, Leeds. Adjourned P.E., Leeds C.C., June 15th, at 11.

M. J. MORGAN, builder and contractor, Boverton, near Cardiff. R.O. May 22nd.

F. WILMOTT, painter and builder, Liabilities £1,416; assets £1,604; surplus £188.

H. GILMAN, joiner and builder, Nottingham. R.O. May 23rd.

S. HACKETT, general decorator, Stapleford. R.O. May 26th.

W. WILKINSON, stonemason and builder, Lancaster R.O. May 23rd.

G. L. SHEPHERD & Co., builders, Bournemouth. R.O. May 26th.

L. SMITH, plumber, Hinckley. Liabilities £608; assets £96; deficiency £511.

G. B. THURLEY, builder, Old Fletton. Liabilities £1,942; assets £585; deficiency £1,357.

J. H. HAIRE, builder, Blackheath. First meeting, 24, Railway Approach, London Bridge, June 8th, at 11.30. .E., Greenwich C.C., June 20th, at 1.

H. T. NORRIS, house decorator, Deal. R.O. May 23rd. First meeting, O.R.'s, Canterbury, June 8th, at 12.30 P.E., Canterbury Guildhall, June 22nd, at 10.

VALLINTINE & CHANDLER, plumbers and painters, Dover. First meeting, O.R.'s, Canterbury, June 22nd, at 9. P.E., Canterbury Guildhall, same day, at 10.

S. WOLFF, builder, Hackney. R.O. May 22nd. First meeting, London Bankruptcy Court, June 7th, at 11. P.E., same, July 4th, at 11.30.

S. KENT, builder and contractor, Acock's Green, Birmingham. Liabilities £1,144; assets £285; deficiency £859.

New Companies.

HALL GREEN BRICK CO., LTD., Lyndhurst, Rooth Street, Wednesbury. Capital: £2,000.

ISHERWOOD CARVINGS CO., LTD., Victoria Chambers, Preston. Capital: £2,000.

J. AND J. T. JOHNSON, LTD., marble and tile merchants, &c., 37, Great Ancoats Street, Manchester. Capital: £5,000.

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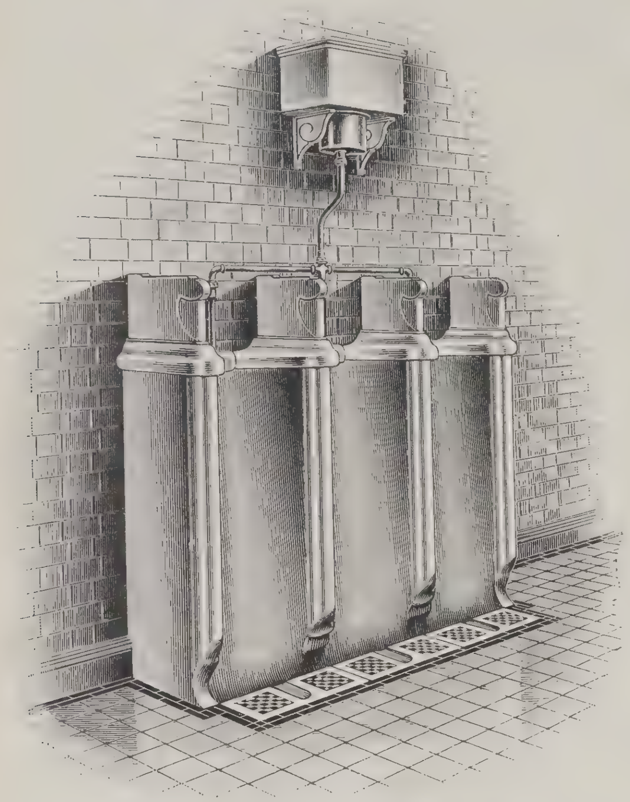

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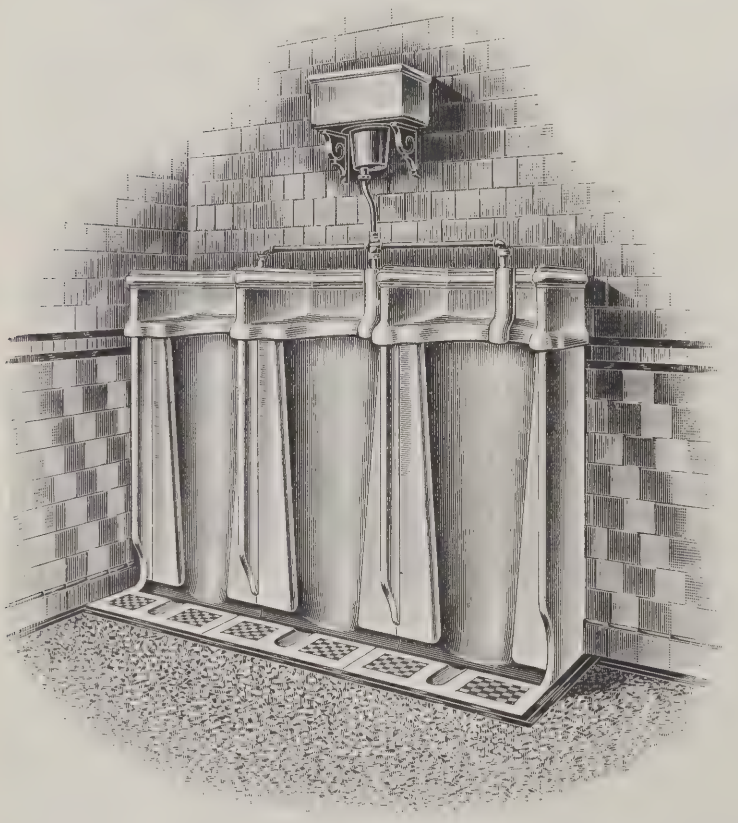

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LONDON: 2 and 3, Norfolk Street, Strand, W.C.	Telegrams, " SALTGLAZE."	Nat. Tel., 1799 Central. ,, 1361 Gerrard.
LIVERPOOL: 21, Leeds Street.	,, " JOSCLIFFS."	,, 1887.
MANCHESTER: L. & N.W. Goods Yard, Ardwick.	,, " FIRECLAY."	,, 2884.
BIRMINGHAM: 1, Edmund Street.	,, " FIRECLAY."	,, 4736.
SHEFFIELD: 38, Church Street.	,, " FIRECLAY."	,, 2469.
HULL: South Side, Queen's Dock, Alfred Gelder Street.	,, " FIRECLAY."	,, 595.
NEWCASTLE-ON-TYNE: 4, Northumberland Street.	,, " FIRECLAY."	,, 877.
MIDDLESBROUGH: Royal Exchange.		

Complete List of Contracts Open.—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		SANITARY—*cont.*		
June	10	Middlesbrough—Sanitary Pans, &c.	Corporation	R. V. Thompson, 42 Commercial Street, Middlesbrough.
"	12	Todmorden—Sewer	Health Committee	Borough Surveyor's Drawing Office, Market Ground, Todmorden.
July	4	London, S.E.—Sewers	London County Council	Maurice Fitzmaurice, County Hall, Spring Gardens, S.W.
		TIMBER:		
June	8	Huddersfield—Wood-paving Blocks	Corporation	R. F. Campbell, 1 Peel Street, Huddersfield.
"	8	Penrhiwceiber, Wales—Winch Boards and Deals, &c.	Navigation Colliery Co.	Secretary, Navigation Colliery Co., Penrhiwceiber.
"	9	Manchester—Timber	Electricity Committee	F. E. Hughes, Electricity Department, Town Hall, Manchester.

List of Competitions Open.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Aug.	1	Hove, Sussex—Library	£50, £30, £20	£1 1s.	H. Endacott, Town Hall, Hove.
"	1	Perth—Reconstruction of Hall	30, 20 and 10 guineas	——	J. Begg, City Chambers, Perth.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Friday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Abertillery.—For the erection of a chancel to the parish church. Mr. C. Telford Evans, architect, 8, Queen Street, Cardiff :—

	£	s.	d.
Skidmore & McWhirter	£2,887	0	0
Gaen Brothers	2,850	0	0
J. Jenkins, Newport	2,823	0	0
D. W, Pugh, Newport	2,765	0	0
N. Bagley	2,519	0	0
J. Jones,* 45, Powell Street	2,494	7	0

* Accepted. [Rest of Abertillery.]

Bishop Sutton (Somerset).—For the reconstruction of offices and latrines and alterations and renovations at the Council schools, for the Somerset County Education Committee. Mr. William F. Bird, architect, Midsomer Norton :—

	£	s.	d.
T. Broad & Sons, Totterdown, Bristol	£895	0	0
Wills & Sons, Bath	746	0	0
E. Colston, Chew Magna	682	17	6
John Flower,* West Harptree	645	0	0

* Accepted.

Brentwood.—For laying sewer and making footpath at Westbury estate, for Dr. C. R. Taylor. Mr. Hugo R. Bird, architect and surveyor, Brentwood :—

	Sewer.			Footpath.
F. W. Jarvis	£66	10	0	£32
Stannard & Wakeling	63	0	0	12
F. W. Burtwell	60	10	0	37
E. Dix*	50	0	0	28

* Accepted.

Brentwood.—For proposed conversion of cottages into stables, for Mrs. Spurgeon. Mr. Hugo R. Bird, architect and surveyor, Brentwood :—

E. Dix	£315
F. W. Burtwell	275

Caeharris (Dowlais).—For the erection of a shop and the rebuilding of the "Ivor Arms." Mr. C. M. Davies, architect, 112, High Street, Merthyr :—

	£	s.	d.
E. Jones	£1,777	0	0
W. Williams	1,731	10	6
E. P. Davies	1,635	0	0
D. Jones	1,573	0	0
E. Williams	1,287	15	0
T. E. Jones*	1,363	10	0

* Accepted. [All of Dowlais.]

Convoy (co. Donegal).—For alterations and additions to premises, for the Convoy Woollen Co. Mr. M. A. Robinson, M.R.I.A.I., architect, Richmond Street, Londonderry :—

	£	s.	d.
M. Sweeney, Londonderry	£11,466	11	9
J. McNally, Cookstown	11,242	15	0
Smyth Brothers, Londonderry	11,061	8	10
Courtney & Co., Belfast	9,879	0	0
Collen Brothers, Portadown	9,763	0	0
R. Colhoun, Londonderry	8,406	15	0
H. Laverty & Sons, Ltd.,* Belfast	8,108	0	0

* Accepted.

Eastleigh (Hants).—Accepted for the erection of a Baptist chapel. Messrs. J. Wills & Sons, architects, Victoria Chambers, Derby :—

	£	s.	d.
Golding & Ansell, Southampton	£3,118	10	2

Exmouth.—For the restoration and additions to Holy Trinity Church. Mr. G. H. Fellowes Prynne, architect, London :—

	£	s.	d.	A.		
W. Cowlin & Sons, Bristol	£20,686	0	0	£2,160	0	0
E. Luscombe & Son, Exete.	20,534	0	0	2,216	0	0
R. Pickett, Ilfracombe	19,129	7	8	792	14	4
W. R. Perry, Exmouth	18,883	0	0	847	0	0
Norman & Burt, Burgess Hill	18,770	0	0	304	0	0
A. Lethbridge & Co., Plymouth	18,429	0	0	1,068	0	0
Stephens & Sons, Exeter	18,076	0	0	1,846	0	0
H. Willcocks & Co., Wolverhampton	17,950	0	0	625	0	0
Stephens Bastow & Co., Bristol	17,905	0	0	1,865	0	0
Goddard & Son, Dorking	17,669	0	0	830	0	0
Dart & Francis, Crediton	17,463	0	0	1,950	0	0
R. Wilkins & Sons, Bristol	16,364	0	0	2,103	0	0

A. Extra if Doulting stone used instead of Monks Park Bath stone.

Farrington Gurney (Somerset).—For the erection of a block of four cottages (Tender A) and the execution of certain works in connection with six other cottages (Tender B), for Mr. Harry Thom Blinman. Mr. William F. Bird, architect, Midsomer Norton :—

	A.			B.		
W. A. Catley, Midsomer Norton	£795	0	0	£570	0	0
Gait & Son, Ston Easton	720	0	0	570	0	0
J. Sperring, Midsomer Norton	693	0	0	561	0	0
J. Flower, West Harptree	670	0	0	560	0	0
F. James & Sons, Holcombe	650	0	0	540	0	0
W. J. Heal,* High Littleton	598	8	0	427	5	0

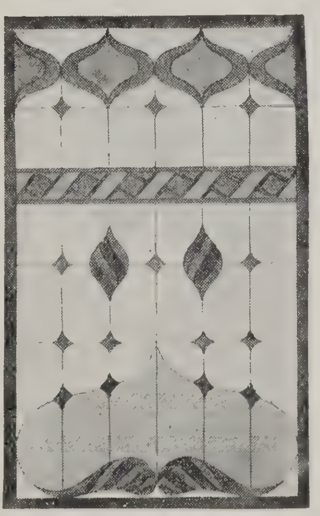
* Accepted.

Shenfield.—For the erection of a house in Worrin Road, for Mr. W. E. Spells. Mr. Hugo R. Bird, architect and surveyor, Brentwood :—

	£	s.	d.
R. Claydon	£694	10	0
F. W. Jarvis	693	0	0
E. Dix	685	0	0
F. W. Burtwell*	675	0	0

* Accepted.

(Continued on next page.)



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TENDERS—*cont. from p.* xxi.

London, W. — For the erection of a disinfecting station (excluding machinery and apparatus) at one of their depots, for the Kensington Borough Council. Mr. William Weaver, M.I.C.E., borough engineer and surveyor :—

	Glazed bricks externally.	Red pressed bricks externally.
Cunningham, Forbes & Co.	£7,131 15 6	£7,707 19 2
J. Barker & Co., Ltd.	6,002 0 0	5,566 0 0
H. Haynes	5,995 1 9	5,544 7 4
J. Wright	5,450 10 0	5,000 0 0
Patman & Fotheringham, Ltd.	5,223 0 0	4,773 0 0
W. King & Son	5,135 0 0	4,863 0 0
W. Wallis	5,105 0 0	4,802 0 0
Higgs & Hill, Ltd.	4,994 0 0	4,594 0 0
F. Wolisten	4,993 13 8	4,698 7 9
Mattock & Parsons	4,992 0 0	4,583 0 0
Kirk & Randall	4,987 0 0	4,627 0 0
J. Mowlem & Co., Ltd.	4,980 0 0	4,640 0 0
R. Dean & Co.	4,900 0 0	4,526 0 0
L. F. Lamplough	4,872 0 0	4,449 0 0
C. Dearing & Son	4,822 15 1	4,545 5 6
Martin, Wells & Co.	4,865 0 0	4,550 0 0
T. Bendon	4,775 0 0	4,445 0 0
W. Lawrence & Son	4,773 0 0	4,354 0 0
A. Hudson & Co.,* 30, Queen Anne's Chambers, Westminster	4,727 0 0	4,456 0 0

* Accepted.

London, W.—For the erection of a new police-station at Notting Hill. Mr. J. Dixon Butler, architect, New Scotland Yard. Quantities by Messrs. Thurgood, Son & Chidgey, Charing Cross Chambers, Duke Street, Adelphi :—

Lole & Lightfoot	£12,849
Lascelles & Co.	12,700
Holloway Brothers	12,676
Lathey Brothers	12,549
Lovatt, Ltd.	12,330
Harris & Wardrop	12,246
F. & F. H. Higgs	12,160
F. G. Minter	11,997
Aldin Brothers	11,973
Spencer & Co.	11,947
Mowlem & Co.	£11,936
Ashby & Horner	11,850
Grover & Son	11,784
Lawrance & Son	11,675
Leslie & Co.	11,305

Midsomer Norton (Somerset).—For the erection of a villa residence at Norton Hill, for Mr. E. J. King. Mr. William F. Bird, architect, Midsomer Norton. Quantities by the architect :—

J. Long & Sons, Bath	£1,985 0 0
A. Wills & Sons, Bath	1,725 0 0
William Webb, Bath	1,717 0 0
F. J. Amer, Bath	1,670 0 0
T. Foster, Radstock	1,547 9 3
J. Bird, Radstock	1,400 0 0
William Tovey,* Midsomer Norton	1,365 8 0

* Accepted subject to amendment.

Midsomer Norton (Somerset).—For alterations to the Wilts and Dorset Bank, for the Wilts and Dorset Banking Co. Mr. William F. Bird, architect, Midsomer Norton :—

J. H. Tovey, Midsomer Norton	£397 15 0
J. Bird,* Radstock	380 0 0

* Accepted.

Midsomer Norton (Somerset).—For the erection of two small villas in North Road, for Mr. Mark Matthews. Mr. William F. Bird, architect, Midsomer Norton :—

W. & A. Edgell, Westfield	£968 0 0
J. H. Tovey, Midsomer Norton	765 0 0
William Tovey,* Midsomer Norton	747 10 0

* Accepted subject to amendment.

Oulton.—Accepted for the enlargement of the Oulton Council school buildings, for the East Suffolk County Education Committee. Mr. F. W. Richards, architect, 14, Stanley Street, Lowestoft :—

Mobbs Brothers, 57, Maidstone Road, Lowestoft	£2,000

Redruth.—For additions and improvements to the Druids' Hall, for the Public Rooms Co., Ltd. Mr. H. W. Collins, architect, Clinton Road, Redruth :—

Hodge & Opie	£1,596
A. Carkeek,* Redruth	1,580

* Accepted.

Reigate.—For the erection of a residence in Blackhorse Lane, for Mr. J. Henderson. Mr. C. E. Salmon, architect, Bell Street, Reigate :—

W. Bagaley & Son	£6,490 0 0
R. Killick	6,315 13 6
J. King & Son	6,080 0 0
W. Wickman*	5,595 0 0

* Accepted.

Roydon (Essex).—For the erection of an eight-roomed house, for Mr. C. F. Steel. Messrs. Barrett & Driver, architects and surveyors, 23, York Place, Baker Street, London, W. :—

C. S. Foster & Son, Loughton, Essex	£420 0 0
Robert Archer, Cheshunt, Herts	390 0 0
C. King, Nazeing, Essex	360 0 0
A. M. Byott, Hoddesden, Herts	337 7 0
G. Chester, Great Purnden	310 0 0
W. E. Clarke,* Hoddesden, Herts	298 10 0

* Accepted.

Southend-on-Sea.—Accepted for the erection of a public library in Victoria Avenue, for the Corporation :—

F. & E. Davey, Ltd., Southend-on-Sea	£7,576

Swanley Junction.—For the erection of an addition to the factory of the Kent Jam Co., Ltd. Mr. W. S. Skinner, architect, Bristol. Quantities by the architect :—

H. L. Holloway	£3,282
F. & H. F. Higgs	3,225
W. Johnson & Co.	3,095
W. F. Blay	2,846
J. Lonsdale,* Swanley Junction, Kent	2,748

* Accepted.

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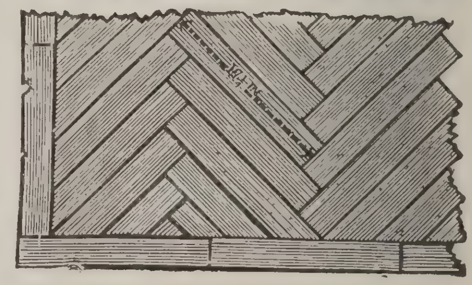

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17¼ × 3 × 1½	6 9	6 3	9 0

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MONTHLY

FIRE SUPPLEMENT

TO THE

BUILDERS' JOURNAL AND ARCHITECTURAL RECORD.

Edwin O. Sachs, F.R.S.Ed., Architect,
Consulting Editor.

Number 8.
June, 1905.

FIRE-PREVENTIVE REQUIREMENTS IN TORONTO.

WE have already dealt with the conflagration at Toronto of last year, and it is naturally of considerable interest to observe the lines upon which the conflagration area is to be rebuilt. This rebuilding is controlled by the new building regulations of Toronto, which were passed in July and December of last year, and under which all new structures are being put up. Seeing that in the Metropolis we are now in the throes of discussion regarding building legislation, we have selected some of the more interesting points regarding the building requirements in Toronto with a view of showing what these Canadian requirements are as based upon the sad experience of last year.

Toronto's new building law, passed July 6th, 1904, and amended December 27th, defines the term "fireproof construction" as follows:—

The term "fireproof construction" shall apply to all buildings in which all parts that carry weights or resist strains are constructed wholly of stone, burnt clay, iron, steel or concrete, and in which the roof and all stairs and also elevator enclosures are made entirely of incombustible material, and all metallic structural members are protected against the effects of fire by coverings of an entirely incombustible material, and which must also be a slow heat conductor. In buildings of this type all door or window mullions, whether vertical or horizontal, shall be faced with cast-iron, terra-cotta or other incombustible material of equal fire-resisting values.

The materials which shall be considered as fulfilling the conditions of fireproof coverings are: first, brick; second, hollow tiles of burnt clay, applied to the metal in a bed of mortar and constructed in such manner that there shall be two air-spaces of at least three-fourths of an inch each by the width of the metal surface to be covered within the said clay; third, porous terra-cotta, which shall be at least 2ins. thick and shall also be applied directly to the metal in a bed of mortar.

The requirements of the new law as to style of buildings are in part:—

(1) All buildings hereafter erected or altered in the city of Toronto so as to exceed 70ft. in height, except churches and grain elevators, shall be of first-class and fireproof construction throughout, and churches containing a seating capacity of 1,200 or more people must be of fireproof construction up to and including the main or auditorium floor.

(2) All buildings intended to be used as an apartment or tenement house, lodging-house or hotel, exceeding 55ft. in height, must be of the first class.

(3) All buildings exceeding 50ft. in height and intended to be used as a college or public school, hospital, asylum or an institution for the care or treatment of persons, and all theatres and opera houses with a seating capacity of more than 1,000 persons, and boiler, engine and dynamo rooms in all buildings, must be of the first class.

(4) Buildings other than the above referred to may be erected in mill, slow burning, ordinary or frame construction, in the several limits hereinafter described.

(7) No buildings shall exceed in height the following times its least dimension at the base:—

For buildings with skeleton frame, 5 times; with masonry walls, only 4 times; for buildings of mill construction, 3 times; with ordinary construction, $2\frac{1}{2}$ times, and frame buildings $1\frac{1}{2}$ times. This also applies to wings of buildings whose length exceeds $2\frac{1}{2}$ times their width, providing no building shall exceed the maximum height established for its respective class.

The following provisions relating to the protection of outside windows are understood to apply to fireproof office buildings, &c.:—

All warehouses, workshops or buildings used for factory purposes which are two storeys or more in height above the sidewalk or curb level shall have doors or shutters made of fireproof material on every window and entrance when the same does not open on the street, the whole to be sufficient to prevent fire from entering the building by such window or entrance, and to be submitted to the Chief of the Fire Department.

(1) When the doors or shutters cannot be put on outside of a building they shall be put on the inside, and in any case shall be hung independent of the woodwork of the window.

(2) Every such door or shutter shall be closed upon the completion of business of the day by the occupant having the use or control of the same, and all fireproof shutters above the ground floor must be so constructed that they can be closed and opened from the outside.

(3) Where fireproof doors or shutters are put on the inside of a building the door and window frames are either to be made of or covered with incombustible material, and the sashes are to be glazed with wired glass.

(4) All windows not provided with fireproof shutters shall have frames covered with incombustible material, and metallic sashes glazed with heavy wired glass, or in lieu thereof shall have automatic sprinklers over them on the outside, or a perforated pipe not less than 2ins. in diameter may be substituted for the sprinklers, in buildings of fireproof construction, or having inside sprinklers. In either case proper and sufficient supply pipes and all necessary valves and fittings are to be furnished, the whole to be made and fixed in such a way as to ensure the proper working of either appliance in case of emergency.

A MUSEUM IN DANGER.

THE Dublin Science and Art Museum is, according to the Board of Visitors, in constant and imminent peril of destruction by fire. In the last annual report attention is again called to the necessity for removing the workshops to a site where an accidental fire would not cause imminent risk of destruction of the museum. The visitors declare that they have discharged the duty cast upon them, and responsibility must rest upon those who neglect their warning.

There have been previous complaints as to the safety of our national collections generally. It would be well if Mr. Spielmann, who succeeded in improving the fire risk of the National Gallery, could be induced to again energetically pursue this question.

A SMALL FIRE AT WHITELEY'S.

THE small fire which occurred at Messrs. William Whiteley's has a point of interest somewhat uncommon to fires generally, namely, to one relating to the accumulation of noxious gases in badly-ventilated compartments.

The chemical department of the London County Council, in a report on a fire which occurred in the Westbourne Grove premises, at which several firemen were partially suffocated and rendered unconscious, draws attention to a serious danger to which firemen are exposed. It states as follows, namely:—

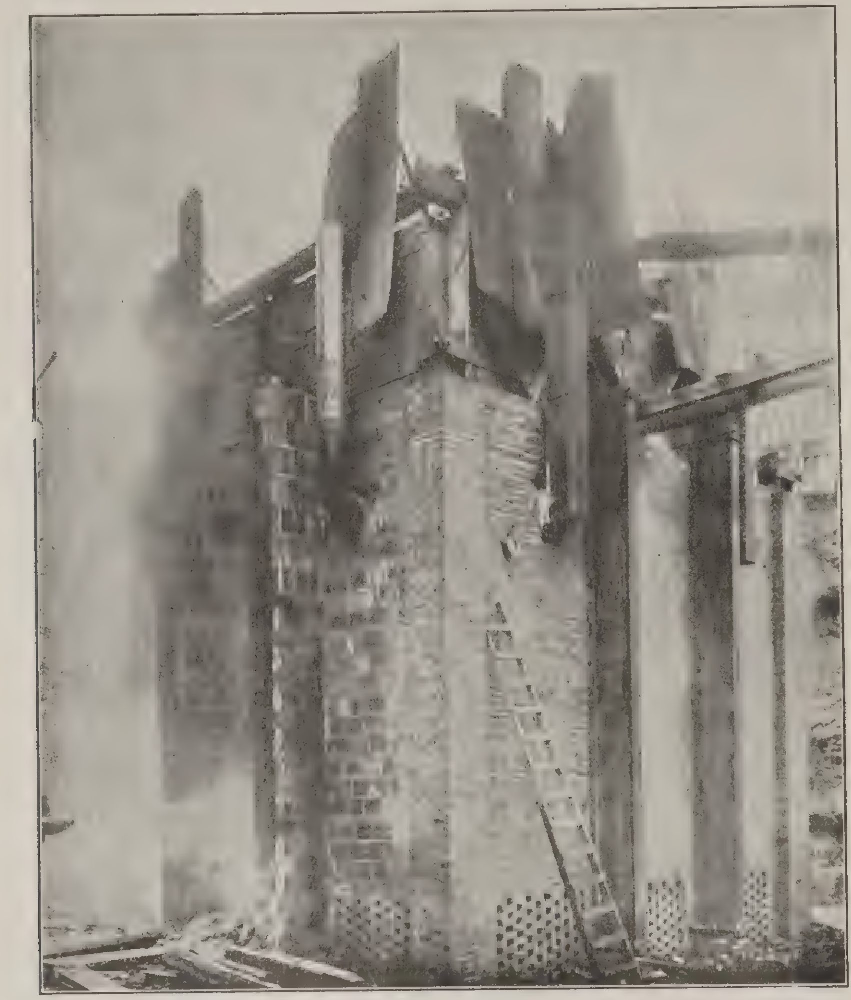
"From the enquiries made and the general appearance of the place, I am of opinion that the loss of consciousness by the firemen was caused by inhaling the mixed gases produced by imperfect combustion, the effect being intensified by the confined space in which the fire occurred.

"The fire seems to have taken place in a long, corridor-like room, where there was practically no ventilation. The want of ventilation probably prevented an extensive fire, as there was not a sufficient current of air to support rapid combustion. In fact, it appears that the wood had undergone to a large extent destructive distillation rather than ordinary combustion.

"This incomplete combustion would not only probably largely remove the oxygen of the air, but might also introduce gases of a distinctly poisonous nature, and this would largely hasten the production of unconsciousness in the men breathing the atmosphere.

"It is probable that the firemen were deceived by the comparative absence of smoke, which may have been removed by the working of the automatic sprinkler, and they may therefore have entered the premises without taking the usual precautions which are adopted when inhaling a dangerous atmosphere.

"I think that it would be desirable if you could arrange that firemen entering premises of this character should use respirators or be furnished with an independent air-supply, as in all probability if such precautions had been adopted on this occasion the bad effect on the men would have been greatly reduced if not prevented."



THE PITTSBURG TEST IN OPERATION SHOWING APPLICATION OF WATER.

SOME MODERN AMERICAN WAREHOUSES.

The Pittsburg Terminal Warehouse.

THE enormous warehouse scheme that is just about to be carried out at Pittsburg, U.S.A., for the Terminal Warehouse and Transfer Co. calls for special attention in this supplement, for several reasons.

First of all, we have here an instance of an American warehouse company systematically going to work with a view of obtaining a fire-resisting building upon which they hope to be able to obtain a very low insurance rate, both for structure and contents. Secondly, we here have an example of what American practice apparently considers to be the right kind of construction to adopt for buildings of this class. Next we have a warehouse company making careful investigations as to the fire-resistance of the system of construction they are about to adopt, and going so far as to call in Professor Woolson of the Columbia University, New York, to undertake some fire tests with the work they propose using; and lastly, we have, by the courtesy of Professor Woolson, received a copy of the official report of these fire tests, which were conducted on similar lines, although not on identical lines, to those of the official New York fire tests, with which his name is primarily associated.

It is always pleasing to see a warehouse corporation systematically taking up the fire aspect of the scheme of building, and it would be well if our own great Harbour Boards and Dock Companies paid greater attention to this aspect of warehouse construction than heretofore.

It is eminently interesting, further, to observe that the up-to-date system of construction adopted by the Terminal Warehouse Co. is not what we had believed would be the probable system, namely, that of flat hard terra-cotta bays, but that the system adopted is a combination of porous arched terra-cotta with cement-concrete. As to the idea of the warehouse companies having a bay of the floor and a section of the partition they propose using put up and tested under conditions not dissimilar to those required at New York, we would only say we trust our own great corporations will in time learn the wisdom of regularly having such tests executed in the same way as, we assume, they generally have their cement tested or their steelwork tested in the question of stresses and strains.

The Warehouses.

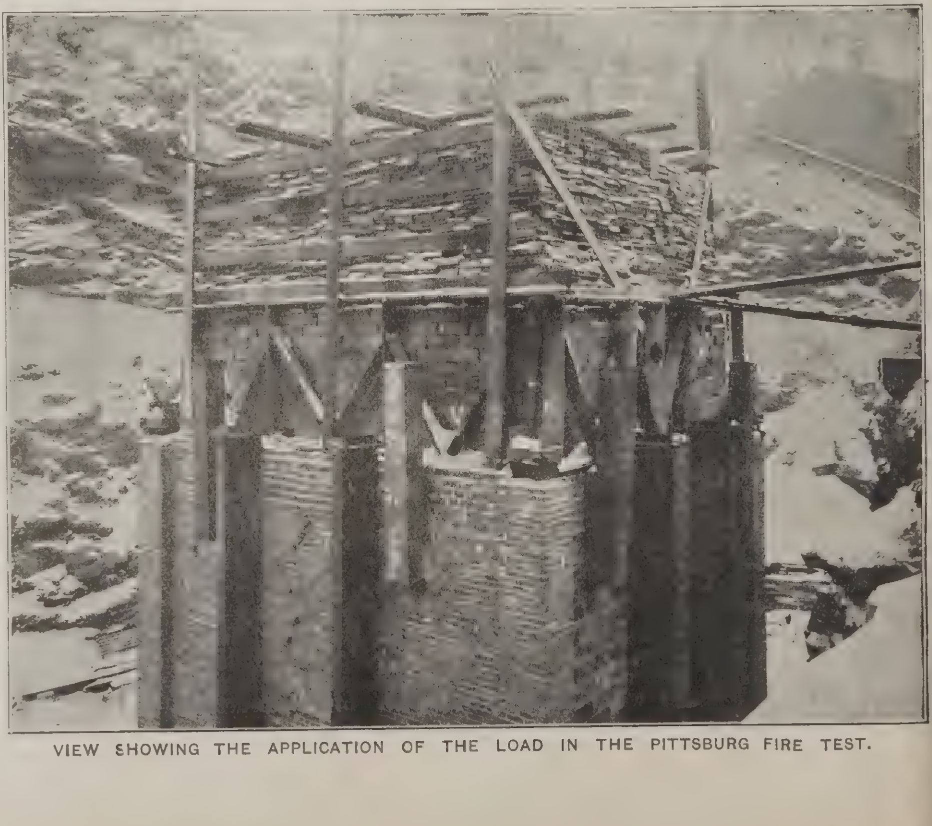
The warehouses, which are located along the Monongahela river, will have first-class wharf and switching facilities for the transfer of all kinds of merchandize by rail and water, and will cost about £400,000. They are designed to represent the highest type of fire-resisting construction, nothing but the latest and the most improved materials being used. The insurance rates, it is said, will be the lowest ever given on any buildings of this class in the States.

The buildings cover an area of 370ft. by 390ft., with basement below first-floor level and six storeys above. The four upper storeys are divided longitudinally by a roadway 45ft. wide leading from Carson Street and extending from the front to the rear of the building. The exterior walls are to be of brick, 13ins. between pilasters. No stone will be used in the construction of the exterior walls, and all sills will be of terra-cotta. The total height of the buildings from the railroad track to the top of the parapet wall is 90ft.

The first floor is arranged for a terminal station with six tracks entering the building; wide platforms are provided on each side of the tracks for receiving and distributing freight consigned to the different warehouses. Elevators are provided for each warehouse, enabling tenants to receive goods directly in their respective warehouses, with equal facilities provided for shipping goods to outside points.

In designing the building, skeleton construction has been employed, and consists of "Z" steel built-up columns beginning at the base and continuing to the top of the roof, connected horizontally at the floor levels with steel beams and girders, each floor being of sufficient strength to bear safely upon every superficial foot of its surface 350 lbs. with a factor of safety of 4. The soil is of such a nature that it was deemed advisable to use concrete piles. Upon this foundation concrete piers were erected, forming the bases of the steel columns.

The buildings are intended to be fire-resisting throughout. The floor and each



VIEW SHOWING THE APPLICATION OF THE LOAD IN THE PITTSBURG FIRE TEST.

bay will consist of four porous terra-cotta arches extending across the bay diagonally and at right angles to each other; 8in. I-beams cambered to conform to the rise of arches will be placed at right angles to the girders and beams, intersecting exactly in the centre of the bays. By this method of construction it will be impossible for one entire bay or floor space to collapse in the event of some heavy object striking the arch. The floor arches are to be levelled with cement-concrete, and topped with a cement finish 2ins. thick.

The arch proper will be made of hollow, porous terra-cotta material in blocks 6ins. deep, 8ins. wide and not over 12ins. long, set with broken joints, the shells averaging ⅞in. thick. The arches will spring from the bottom flanges of the corner beams, thus diverting the loads direct to the columns, and have a rise in the centre of 18ins. above the flange.

The roof is on what is known as the "Johnson system of construction"—a wire mesh laid over the centering, this mesh to be embedded in cement-mortar not less than ¾in. thick in the proportion of 1 part of cement and 2½ parts of sand, the tile laid in same and grouted in position. All beams are to be covered with terra-cotta, the covering of the bottom flanges of the beams to be not less than 2ins. thick. The top is to be levelled off with cement-mortar and made smooth ready for the roof-covering, which will be 4-ply roof gravel.

All floors will be solid without openings, except the stairways and elevators, and will be inclined toward the division wall away from the side in which the floor openings occur, and at an inclination of 1in. in 20ft. Gutters will be formed of cement, with a 4in. pipe passing through walls on each floor-level, with light swinging cap attached to the pipe.

The Combined Floor and Partition Test.

The following is a summary of the report of the official fire test with the porous terra-cotta flooring system carried out by Professor Woolson. Test started 11 a.m.; water applied 3.16 p.m.; age of floor when tested twenty-four days:—

Method of Construction.—The test building was of steel frame construction 20ft. by 22ft. with corner posts and I-beam girders between. The longer girders were 24ins. deep, and the shorter ones 18ins. deep. This frame was encased by a 13in. brick wall on two sides and by a 9in. combination tile and cement wall on the other two sides, the object being to study the relative merits of the two types of walls as fire barriers

The floor to be tested constituted the roof of the test building. It was constructed by forming a groined arch of 6in. hollow tile between the girders, with a rise of 17ins. at the crown. Above the tile was a concrete filling of about 4ins. over the crown and 18ins. at the haunches. The arches were sprung from the corners of the rectangular floor-space instead of the sides, thus throwing the greatest thrust to the corners where the framework could best resist the load.

For the purpose of reinforcement, two 8in. I-beams were put in between each pair of girders at the middle and meeting in the centre of the floor span. These beams were cambered to the curvature of the arch and divided the test floor into four equal parts. They were encased by the floor tile.

The construction was practically a reproduction of one unit of the floor system to be used in the new Pittsburg Terminal Warehouse and Transfer Co., in which there are to be 800,000 sq. ft. of floor space all divided into spans 20ft. by 22ft. the same as this.

Full details of the construction are shown in the accompanying drawings and photographs.

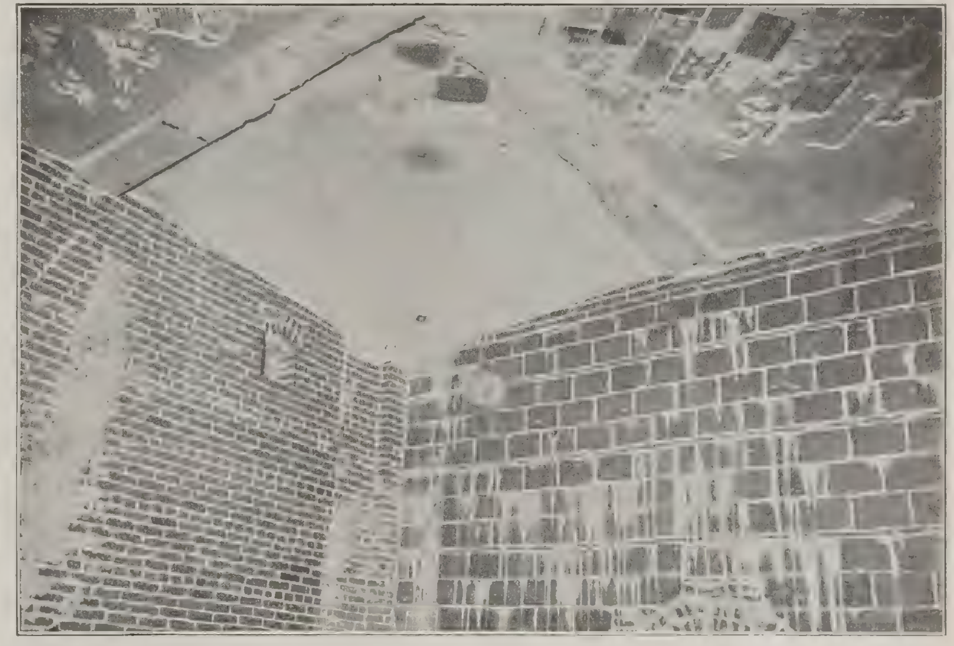
The floor proper of the test building was formed of an open chequerwork of brick, the same as a kiln floor, and upon this the fire was built. The ceiling was 15ft. 4ins. above the floor. Suitable draft openings, smoke flues and firing-door were provided.

The concrete "fill" was mixed in the proportions of 1 vulcanite Portland cement, 3 river sand and 6 gravel. The tile ceiling was given a protective coating of 1in. of cement.

Purpose of the Test.—The purpose of the test was to determine the effect of a continuous fire below the floor for four hours at an average temperature of 1,700 degs. F., the floor carrying at the same time a distributed load of 270 lbs. per sq. ft.; at the end of the four hours the underside of the floor (or ceiling) while still red hot to be subjected to a ⅛in. stream of cold water at short range under 60 lbs. pressure for ten minutes. Deflection of floor to be measured continuously during the test

Temperatures.—The temperatures of the fire were obtained by two electric pyrometer couples suspended through the floor from above and hanging about 6ins. below the ceiling. One couple was near the crown of the arch, and the other in a corner, distant about 3ft. from each wall.

Readings were made upon each couple every three minutes. The fuel used was dry refuse-wood, the frequency of firing being determined by the temperature of the test chamber.



VIEW OF FLOOR AND PARTITION AFTER THE PITTSBURG TEST.

Deflections.—The deflection which occurred at various stages of the test were measured by a Y-level reading upon a rod located upon the middle of the floor slab. The deflections were read by Mr. Bailey, an engineer detailed from the Pittsburg Testing Laboratory.

Water.—The water was applied by city firemen with a steamer. The nozzle pressure was well above 60 lbs. The firemen estimated it at 75 lbs. to 80 lbs.

In applying the water the stream was thrown back and forth over the whole ceiling as much as possible and not allowed to strike continuously in one place. As it was not practicable to flood the roof, as is customary in tests of this character, the stream was played on the ceiling continuously for ten minutes at full pressure.

Results of the Test.—Owing to the very large size of the test chamber and an insufficient flue area for the volume of fire, together with the fact that the fuel supply in the early part of the test was not suitable to feed a fire of such magnitude, it was impossible to get high temperatures during the first half of the test.

The quality of the fuel was changed during the latter part of the test, and the building having become thoroughly heated it became easy to maintain high temperatures.

Because the temperatures in the early part of the test were low, which resulted in lowering the average, it was decided to ignore the first fifteen minutes of the test, and make it up by extending the time fifteen minutes over the four hours.

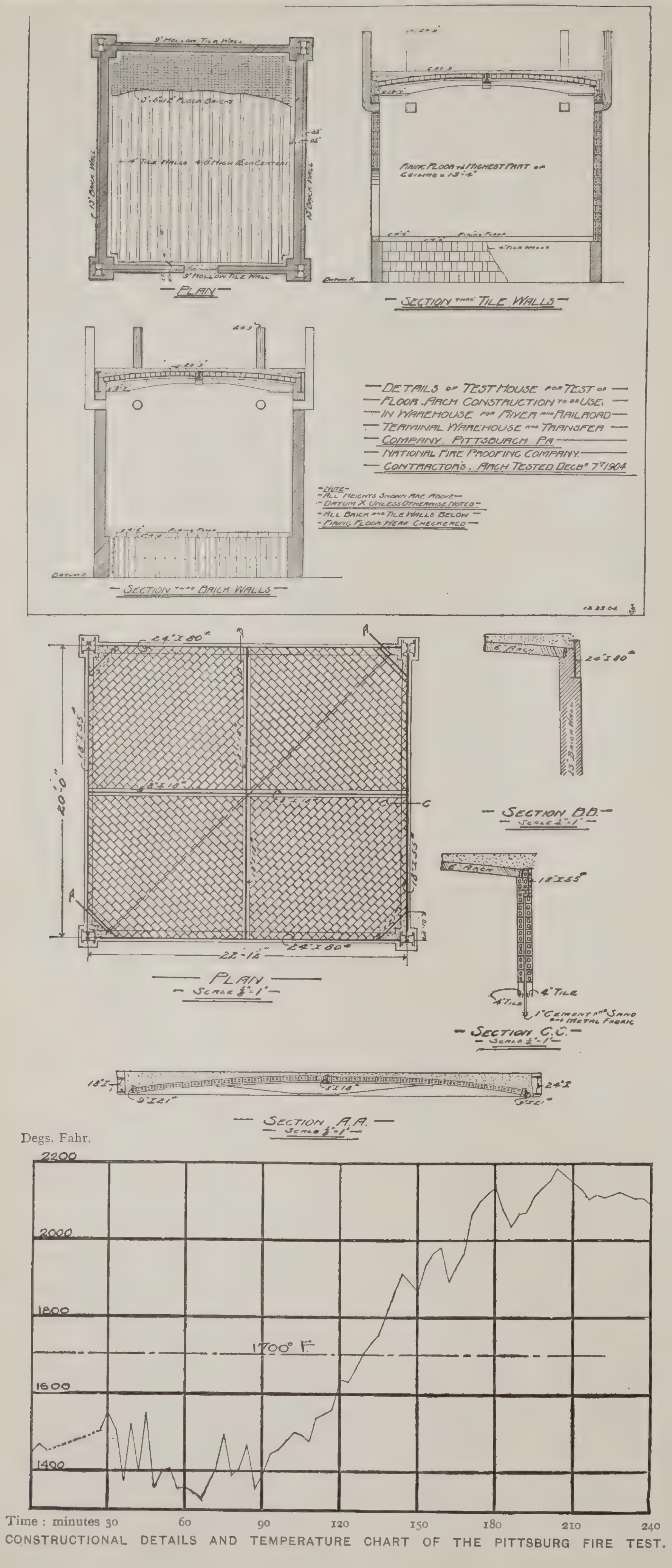
The cement coating on the ceiling began to blow off about ten minutes after the fire started, and a considerable portion of it fell before the expiration of the test. The roof was covered with a load of hollow tile several feet deep, making it impossible to ascertain whether any cracks developed there or not. As the roof was in compression in all parts, and the deflections recorded were very small, it is not likely that cracks did occur there.

After application of the water, it was found that the cement coating was gone and the tile exposed where the water struck the ceiling, but the tile appeared to be in perfect condition with no cracks or broken parts. At least, none were apparent under a hasty inspection by torch immediately after the test.

The maximum deflection recorded during the test was a trifle under ½in., and the average temperature at the middle of the ceiling was 1,725 degs. F.

The report of this test is naturally one of great interest, but we think we should immediately say that there were two important elements whereby the results shown would probably have not been quite so good in New York, and certainly not in this country.

The first is that the severity of the fire was certainly not that to which we are used to in London. In looking through a detailed record of the temperatures we find that practically two hours had elapsed before the temperature of 1,600 degs. Fahr. was reached, or in other words the temperature during the first half of the test did not exceed that which in this country we apply to ordinary wire glass or electro-glazing of ¼in. thickness. During the second half of the test, it is true, the temperatures rose, but here again the impingement of the flame could have been nothing compared with the impingement in this country, having regard to the fact that only an ordinary wood fire was applied as distinct from a fire produced with the aid of gas. By the aid of gas the actual conditions of a fire are assimilated, *i.e.*, flame and heat are applied in that force which is common wherever there is a draught during a fire.


9" Hollow Tile Wall
3"·6"·12" Floor Brick
4" Tile Walls 4'-0" High 12" on Centers
13" Brick Wall
13" Brick Wall
9" Hollow Tile Wall
— Plan —
Firing Floor to Highest Part of Ceiling = 15'-4"
Firing Floor
4" Tile Walls
Datum X
— Section thro' Tile Walls —
— Details of Test House for Test of —
— Floor Arch Construction to be Used —
— In Warehouse for River and Railroad —
— Terminal Warehouse and Transfer —
— Company. Pittsburgh Pa —
— National Fire Proofing Company —
— Contractors. Arch Tested Decbr 7th/1904
- Note -
- All Heights Shown Are Above -
- Datum X Unless Otherwise Noted -
- All Brick and Tile Walls Below -
- Firing Floor Here Checkered -
Datum X
— Section thro' Brick Walls —
12 23 04
24" I 80#
A
A
18" I 55#
20'-0"
8" I 18#
C
18" I 55#
A
22'-1/2"
24" I 80#
— Plan —
— Scale ⅜"-1' —
6" Arch
24" I 80#
13" Brick Wall
— Section BB —
— Scale ⅜"-1' —
6" Arch
18" I 55#
4" Tile
4" Tile
1" Cement and Sand and Metal Fabric
— Section C.C. —
— Scale ⅜"-1' —
18" I
8" I 18#
24" I
9" I 21#
9" I 21#
— Section A.A. —
— Scale ⅜"-1' —
Degs. Fahr.
2200
2000
1800
1700° F
1600
1400
Time : minutes
30
60
90
120
150
180
210
240

CONSTRUCTIONAL DETAILS AND TEMPERATURE CHART OF THE PITTSBURG FIRE TEST.

Besides this, we consider that the height of the floor above the actual bed of the floor was too high, and certainly higher than it would have been permissible either in New York or in this country. As far as we can see, the floor was 15ft. above the bed of the fire, or nearly twice as high above the bed of the fire as would be the case during an official test in this country.

The floor and partitions were constructed by the National Fireproofing Co. of the U.S.A., who have also recently applied for tests under London conditions, so that comparative results should be shortly obtainable.

WINDOW AND DOOR OPENINGS.

THE following are extracts from an important report presented by the special committee of the full meeting of the National Fire Protection Association of the United States at their meeting of May 23rd and May 25th, with a copy of which we have been favoured. The lengthy document is supplemented by numerous rules.

While considerable progress has recently been made in the development of various methods of protecting openings in walls against fire, these developments have been mainly along the line of improvements in existing practice, and the Committee cannot but feel that far greater advancement must be made to place this engineering problem abreast with the times. Methods and materials are still being commonly used and approved which are unsuited for the purposes for which they are intended.

Recent tests and investigations indicate that for openings of ordinary size the so-called standard tin-clad door and shutter, all things considered, furnishes the most reliable protection, particularly when the exposures are severe. The superiority of this type is very largely due to its efficiency as a non-conductor of heat. This offsets in a large measure inherent defects in other respects.

It is only fair to say that recent tests have shown that certain forms of doors have superior fire-retardant qualities to the tin-clad, wood-filled fire door, but their practicability in other respects has not as yet been fully demonstrated. Doors and shutters having the desired fire-retardant qualities, a more acceptable appearance and in which no inflammable materials are used are urgently needed. The standard vault door and the iron shutter would seem to take second place as fire-retardants for general use, their mosto bjectionable feature being the transmission of heat.

Wired glass properly framed is classified as third on the list of retardants now in common use. Like thin iron shutters, its most objectionable feature is due to the fact that when severely exposed the passage of heat through the glass is extreme. There is a vast field for the intelligent use of this material, but its limitations should be recognized. A continuation of many of the present practices in its use will undoubtedly result in disaster and possibly in the discredit of its real value. Wired glass mounted in frames which are so poorly designed and constructed that they will hardly hold together until installed in the wall, and in frames which when heated are unable to withstand even the smaller jets from fire stream, will hardly prove of sufficient value to warrant the consideration with which they are now so commonly favoured. The use of inflammable putty in which the glass is almost always set in itself constitutes a danger under many conditions of service.

Polished plate and prism glass in units not exceeding 4ins. square, electro-glazed and properly framed, should, in our opinion, be classed with wired glass as a fire-retardant.

Although at present not very generally used or recognized as a fire-retardant, the steel rolling door and shutter undoubtedly fills a valuable place in the list of retardants. Its greatest defect is due to radiation.

FIRE PREVENTION AND THE L.C.C. BILL.

THE London County Council are now busy considering an Amendment Bill for the London Building Act, to be put forward for the session of 1906. In order to make their views clear they have taken the wise step of having the clauses of their proposed Bill of 1905 embodied in a copy of the existing Act and issued with explanatory notes as to the bearing of the proposed amendments. It is only regrettable that this had not been done before, as we believe it would have prevented much of the opposition. Besides this valuable document, a memorandum has been issued by the chairman of the Building Act Committee which, in precise language, explains the objects and reasons for the proposed amendments. The part that deals with the subject under review in this supplement we give verbatim, and we think the chairman of the London Building Act Committee should be congratulated upon the lucidity with which he has put forward the Council's case regarding the provisions in respect to danger from fire.

There is one point, however, which although not primarily mentioned under the heading of "Danger from Fire," very materially affects this problem. This is the removal of a restriction which has so far had a most beneficial effect on the reduction of fire loss. It has up to the present only been possible (and then only with the permission of the London County Council) to erect buildings of a cubical content of 450,000 cub. ft. It is now proposed to leave the cubical contents to the discretion of the County Council. This, we think, is a retrograde movement as far as fire-protection is concerned, and should not be encouraged by those who have the interests of fire-protection at heart. It will also no doubt be opposed by the insurance companies who have a vested interest in this question.

It is advisable that there should be greater facility for considering units of buildings of considerable cubical dimensions in which the division is horizontal and not necessarily vertical, but to allow units of quite discretionary cubic content in the Metropolitan area would mean the advent of an additional conflagration hazard, the terrible results of which have been so visible in the great fires of the Americal cities, where to a very great extent the conflagrations have been due to the large contents of the first building affected by fire.

Present Position.

This Bill was set down for second reading in the House of Commons on 14th March, 1905, and by an arrangement between the members of Parliament in charge of the Bill and of the City of London (Escape from Fire) Bill it was agreed to drop all parts of the Council's Bill with the exception of Part VIII. (Means of escape from Fire, &c.). Part VIII. of the Bill then passed the second reading without opposition. The withdrawal of the other parts of the Bill affords the Council an opportunity of ascertaining the views of the local authorities and the various professional and other associations concerned on the proposals contained in the Bill, and on 4th April, 1905, the Council decided to take advantage of this opportunity and to send the Bill, with the amendments to the existing Acts clearly shown, to all the authorities concerned, with a request that they would acquaint the Council at as early a date as possible with their views as to the amendments that should be made in the London Building Acts. The Bill will thus afford a basis for discussion by all the authorities concerned, and it is hoped that in this way it will be possible to arrive at some degree of unanimity as to the principles that should govern the amendments to be sought in a new Bill. The question is one of some difficulty to those who have not made a study of the Building Acts, and this memorandum has therefore been drawn up with the object of conveying in as simple a form as possible some idea, not only of the scope of the proposals contained in the Council's Bill, but of the reasons which actuated the Council in promoting the Bill. Although Part VIII. of the Bill has passed the second reading in the House of Commons, it is thought undesirable to omit reference to it at present.

Legislation prior to 1894.

Prior to 1894 the Acts relating to streets and buildings in London were thirteen in number. The London Building Act, 1894, consolidated and amended the enactments relative to streets and buildings contained in these thirteen Acts, and it may be useful to state briefly the facts relating to the passing of the 1894 Act.

In 1890, the Council being of opinion that the building law, both constructional and sanitary, should be strengthened and then consolidated, certain provisions for effecting that object were included in the Council's General Powers Bill of that session. These provisions met with considerable opposition and criticism before Select Committees of both Houses. On 23rd December, 1891, the Council, having learned that it was the intention of the Government to introduce a Bill to consolidate the Metropolitan Building Acts, authorized the Building Act Committee to lay the amendments suggested by them before the President of the Local Government Board and to confer with him as to any other amendments which might appear desirable during the progress of the Bill. As no Bill dealing with the suggested amendments was introduced by the Government during 1893, the Council decided to introduce a Bill. This was accordingly done, and the Bill was read a second time in the House of Commons and referred to a hybrid committee. Forty-seven petitions were lodged against the Bill, which occupied the Committee for twenty-two days, and during this time was considerably altered. After passing the House of Commons, the Bill was for four days before a Committee of the House of Lords, but it passed the Upper House without substantial alteration, and as the London Building Act, 1894, received the Royal Assent on 25th August, 1894.

Necessity for Amendment.

In 1898 a short amending Act was passed, but this affected only four out of the 218 sections contained in the principal Act, and the building law of London may practically be regarded as comprised in one Act at the present time. As might be expected in an Act dealing with a subject of such magnitude as the building law of the greatest city in the world, cases have from time to time come to the notice of the Council which clearly illustrate the need for an amendment of the law; in some cases in the direction of making the existing provisions more stringent, in others in the direction of affording greater facilities for building operations. The rapidity with which building has proceeded of late years, with the consequent covering over of open spaces, has rendered it imperative to make some provisions for future needs as regards light and ventilation by requiring a greater width for new streets. The serious number of fatal and destructive fires has demonstrated beyond doubt the inadequacy of the existing provision for securing means of escape in case of fire and for preventing the spread of fire. On the other hand, the changes which have taken place in industrial conditions render an alteration in the law necessary in order to enable buildings to be erected of large size without the restrictions which the present law imposes, and which have the effect of seriously hampering trade and manufacture in the county of London. Moreover, the tendency of the age is to accentuate the importance and the necessity of the adoption of time-saving methods in every branch of industry, and in building the need for rapidity has led to a stronger demand for greater facilities being given for the use of iron and steel construction.

Amendment Bills 1903 and 1905.

While the Council was collecting material for an amendment of the Act of 1894, there occurred on 9th June, 1902, at No. 67, Queen Victoria Street, a fire in which ten lives were lost. In August, 1902, the Home Secretary wrote to the Council stating that, in view of the facts disclosed at the inquest on the Queen Victoria Street fire, he thought that the question of further legislation on the subject of safety from fire in high buildings required early consideration; that in his opinion the matter could not be adequately dealt with by a mere extension of the powers of the Council under the Factory and Workshop Act, 1901, and he was therefore disposed to think that any new legislation should take the form of an amendment of the London Building Act, 1894; and as this Act was a local Act any amendment of its provisions would naturally be by a private Bill promoted by the Council, and that, so far as it might be possible for him to do so, he would be glad to assist in any proposal that might be made for that purpose. The Home Secretary subsequently informed the Council that he would have no objection to the extension, under proper conditions and in suitable cases, to existing buildings of provisions with respect to means of escape from fire, provided adequate provision were made for allowing the owners or occupiers of existing buildings an appeal to an arbitrator or to some other tribunal. When the first letter from the Home Secretary was received in August, 1902, there was not sufficient time to make it possible to introduce in the then next session of Parliament a Bill to secure all the amendments which were known to be necessary in the Act of 1894. It was, however, felt that the Council ought to avail itself of the support promised by the Home Secretary, and at once prepare a Bill to amend the provisions of the Act dealing with fire-prevention and the means of escape from fire. This was accordingly done, and on 10th November, 1902, the Home Secretary wrote stating that the Council's proposals with regard to the provision of means of escape appeared to him to be such as, in principle, might properly be submitted to Parliament and dealt with on their merits by Select Committees of the two Houses after a full consideration of the various interests involved; that there were points of detail which in his opinion might require further consideration, but that these could be better dealt with by the Select Committees, who would not only hear the Council and consider any suggestions that might be made by Government departments, but would also give a full hearing to all persons who might be affected by the proposed legislation.

With a view to affording time for consideration of the views put forward by the representatives of the various interests affected by the Bill, and in the hope of securing the harmonious co-operation of all concerned in the amendment of the Act, the Council decided not to proceed with the Bill. The Building Act Committee were subsequently instructed to prepare proposals for securing the necessary amendments to the London Building Act, 1894, and letters inviting suggestions as to the amendment of the Act were sent by the Committee in June and again in November, 1903, to the Corporation of the City of London and to the Metropolitan Borough Councils and also to professional and other authorities concerned.

The Bill of 1905 was the outcome of the Committee's work, and was drafted after careful consideration of the suggestions made by many of the Metropolitan Borough Councils, by the Royal Institute of British Architects, the Surveyors' Institution, the British Fire Prevention Committee, the District Surveyors' Association and many other bodies. The provisions with regard to means of escape in case of fire were based upon the proposals which were included in the 1903 Bill, and which, as stated above, were considered by the Home Secretary to be such as, in principle, might properly be submitted to Parliament.

Danger from Fire.

The necessity of further legislation on the subject of safety from fire was, as has been already stated, the subject of correspondence between the Home Secretary and the Council in 1902, and has been generally admitted, even by the persons and authorities who are most averse to any amendment of the building law in other directions. Should any evidence be needed, however, it is afforded by the following particulars of recent fires:—

Situation of premises.	Date of fire.	Lives lost.	Remarks.
339–343, Wandsworth Road, S.W.	4th March, 1902.	3	The Fire Brigade Committee reported to the Council that they were of opinion that in cases where shops are built on the forecourts of houses, adequate means of escape should be provided for the occupants of such premises.
Barbican, E.C. (fire originated in Nos. 10 and 11).	21st April, 1902.	None	The fire resulted in the almost total destruction of Nos. 8 to 14, Barbican (south side), part of No. 74, Aldersgate Street, Nos. 60, 61, 62 and 63, Barbican (north side), and Nos. 2 to 9, New Zealand Avenue. Other premises in Barbican were more or less damaged by fire, as were also certain premises at the north end of New Zealand Avenue, which is a *cul-de-sac*. The coroner's jury deprecated the use of matchboarding for walls and ceilings.
Queen Victoria Street, E.C. (fire originated in No. 67).	9th June, 1902.	10	The coroner's jury recommended that the London Building Act, 1894, be made retrospective as regards the provision of means of escape from high buildings.
Messrs. Dixon & Haynes' furniture repository, Harrow Road.	11th Sept., 1902.	None	Considerable difficulty was experienced in attacking the fire from the rear of the building, as there were no back entrances or means of placing ladders in position at close quarters.
Ben Jonson Road, Stepney -	29th Dec., 1902.	6	The fire originated in the front projecting shop, and the deaths occurred on the second floor.
Brownlow Street, Holborn -	18th Jan., 1903.	3	The building was one of five floors about 40ft. by 30ft., used as stores and dwelling-house. The fire occurred in the basement and the upper part of the building was filled with dense smoke.
Hackney Road, N.E. - -	19th Oct., 1903.	3	Descent to the ground floor was rendered impossible by the dense smoke rolling up the staircase.
Duke's Head Passage, E.C.	25th Feb., 1904.	7	The coroner's jury recommended that the authorities should have full power to inspect all buildings and compel the owners to supply proper means of exit to the roof by means of fixed ladders or other means of escape.
Judd Street, Brunswick Square, W.C.	19th Oct., 1904.	6	The fire originated on the first floor, and the deaths occurred on the second and third floors.
Westminster Bridge Road, S.E.	2nd Nov., 1904.	1	The coroner's jury at the inquest held on the fire expressed the opinion that greater power should be given to the district surveyors to enter and examine dilapidated buildings with a view to greater security from fire.
City Mill building, 1, Upper Thames Street, E.C.	17th Jan., 1905.	None	The coroner's jury expressed the opinion that the building was not of suitable construction for the business carried on therein, and that ample and adequate means of exit should be immediately provided for the safety of the persons employed there, as the building was a most dangerous place in case of fire.

The principal fire provisions are briefly as follows:—

(*a*) That every building (both new and existing) of more than one storey above the ground storey, or of one storey only above the ground storey, but exceeding 25ft. in height shall, unless the Council otherwise allow, be provided with means of access to the roof, and with a parapet or guard rail, where necessary, to prevent persons slipping off the roof. Under the existing law means of access to the roof is required in certain cases.

(*b*) That in every building of which the floor of any storey exceeds 50ft. in height above the street level sufficient means of escape and precautions against the spread of fire are to be provided and maintained. Under the existing law means of escape can be required from the storeys above 60ft. in height.

(*c*) To require means of escape in case of fire from—

(1) Buildings in which sleeping accommodation is provided for more than twenty persons, or in which more than twenty persons are employed.

(2) Buildings used partly for shop purposes and partly for dwelling, where the shop portion projects more than 5ft. beyond the building.

(*d*) To apply the above provisions (*b*) and (*c*) to existing buildings; and to provide for referring disputed matters to arbitration, and for an equitable division of the cost of the alterations between the freeholders and leaseholders.

(*e*) To require the provision of means of escape from new buildings having any storeys above the ground storey and exceeding ten squares in area, and used partly for trade and partly as a dwelling-house.

(*f*) To prohibit the use as living-rooms or workshops of rooms above, or directly communicating with, oil shops without (1) the provision of adequate safeguards to prevent the spread of fire from the oil shop to other parts of the premises, and (2) the provision of means of escape from such premises.

(*g*) To regulate (1) the use of matched-boarding and panelling as an internal finishing to ceilings, walls, &c., and (2) the enclosing of lifts in buildings; and to protect in new buildings of the warehouse class windows within a dangerous distance of openings in other premises.

No more dangerous policy can be advocated than that of providing for escape from buildings in case of fire solely by means of access to the roof. A means of access from the top floor of a building to the roof cannot be relied upon as affording an escape from the floors below the top floor, and, as regards even the top floor, it can only be considered valuable when there are means of escape from the roof of the building to adjoining premises. For efficient means of escape from any large building it is essential that there shall be alternative means of egress of some kind from each floor, so that wherever a fire may occur persons may not be cut off by flame and smoke from the only means of escape.

SOME RECENT PARTITION TESTS.

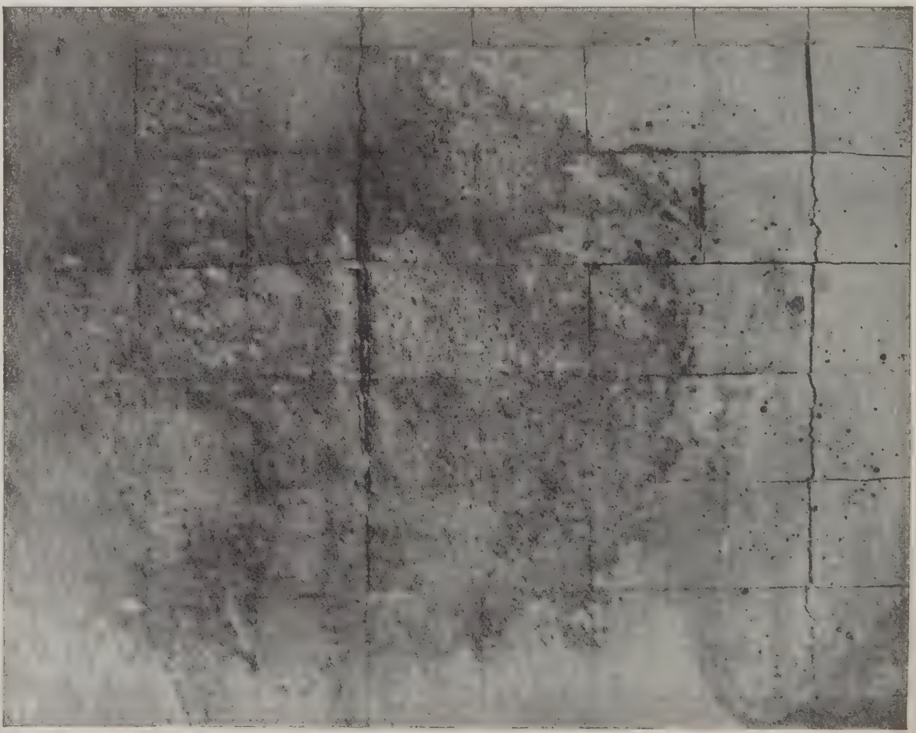
TWO reports (Nos. 92 and 93) have been issued by the British Fire Prevention Committee regarding fire tests with Mantada partitions, constructed by the Adamant Co., of Birmingham and London.

In both tests the manufacturers desired to attain classification in the fully protective class for partitions of 2½ins. thickness and under, such classification being obtainable if the partition withstood successfully a fire test of 2½ hours, followed by the application of water from a steam fire engine for a period of two minutes.

In their first test the manufacturers put forward a partition 2½ins. thick. This partition withstood the fire test, but part of it fell on the application of water.

At the second trial the partition put forward was of 2½ins. thickness. In this case the fire was let through the partition after about an hour and forty minutes, through a vertical crack, but the partition did not fall, as was the case with the former partition, on the application of water.

The moral of these two tests is a very obvious one: the Mantada slabs are certainly very good slabs from the fire point of view, but their application is not yet satisfactory. It is to be hoped that more care and forethought will be applied by the manufacturers in respect to the question of erecting partitions of their material, so that not only the material but the actual partition will stand up against the fire and water test in the manner they would no doubt wish, which would give them the record for thin partitions of 2½ins. and under.



THE SECOND (2½-INCH) PARTITION (FROM INSIDE) AFTER THE FIRE AND WATER TEST

As far as we can see, in the first test the partition collapsed because the jointing was not of such a character as to make the partition a rigid one when a stream of water touched it.

In the second test the makers have apparently tried to remedy this by inserting metal rods, but they went to the other extreme and put in too much metal rod work, with the result that one of these rods, probably expanded, caused the crack, and let the fire through.

What is required in partitions of this kind is quite a small thin dowel to supplement a good system of jointing. As in the case of other tests, we give the "object of test," which was identical in both cases, and the two summaries of tests. We supplement these by an illustration of the second test, showing the crack where the fire got through, but showing how the partition stood up after the water had been applied.

Object of Tests.

To record the effect of a fire of 2½ hours' duration at a temperature gradually increasing to 1,800 degs. Fahr. (982·20 degs. C.), and not to exceed 2,000 degs. Fahr. (1,093·3 degs. C.), followed by the application of water for two minutes on the fire side with the view of being classified as affording "full protection" (Class A).

Summary of Test I.

During the fire test the partition buckled outwards ¾in. (·019 m.). No fire or smoke passed through the partition. The recorded temperature in the passage on the outside face of the partition at no time exceeded 220 degs. Fahr. (104·4 degs. C.). On the application of water about 20ft. super. (1·8 sq. m.) of the partition fell.

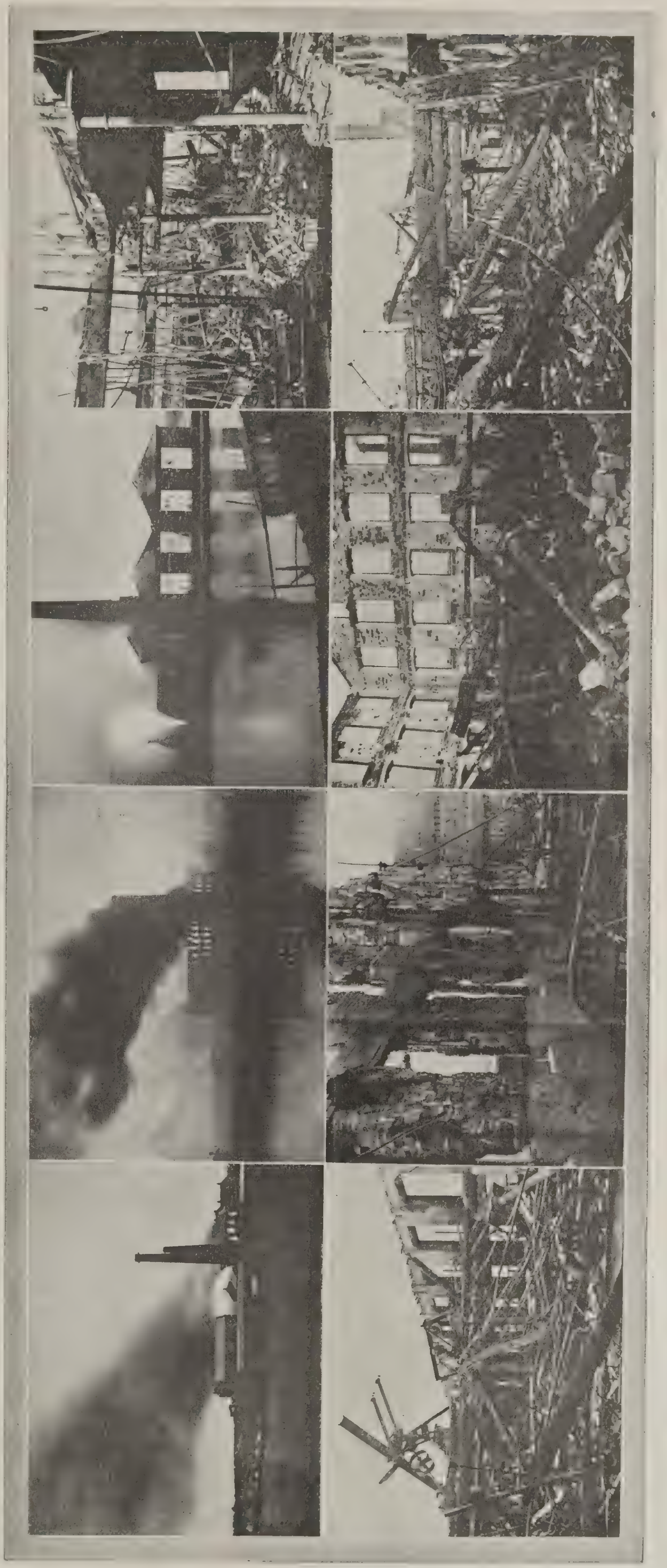
Summary of Test II.

After 53 minutes the partition commenced to bulge inwards, and continued to do so to the end of the test. The maximum deflection was 4⅜ins. (·111 m.). After 100 minutes a vertical crack appeared in the centre of a slab in the 6th course 4ft. (1,219 m.) from the north end of passage, and gradually extended upwards to the 8th course and downwards to the 3rd course. This crack gradually increased in width, and eventually fire and smoke passed through. On water being applied on the inside it came through the various open joints on the passage side. The partition remained in position at the conclusion of the test.

A LANCASHIRE MILL FIRE.

We are enabled, by the courtesy of "The Engineering Times," to reproduce several photographs of a fire at a Lancashire cotton mill. The following is an extract of an interesting article by Mr. J. H. Crabtree, H.M. Inspector of Factories, that accompanied them:—

Factories in the cotton county are noted the wild world over for their large dimensions, and specimens of five-storey mills are not rare in which we may count thirty-five windows in the length and twenty-five in the breadth thereof. Each floor represents few rooms, not more than two or three at the most; the ground floor is occupied by the machinery for carding and spinning the cotton fibre in its initial stages of treatment. This machinery is known as the "preparation" department. From the ground floor the partially spun cotton is carried on bobbins to the mule-spinning rooms above, generally styled "first," "second," and "third" spinning rooms, where the cotton is spun and attenuated into threads of various "counts" or degrees of fineness. Each of these upper floors is usually divided by the entrance stairway into a large and a small mule-room, the former having twenty to forty mule-frames or machines and the latter having six to twelve frames.



The outbreak of fire.

Flame through windows.

Bursting through roof.

Fireproof floors give way.

Girders held in mid-air.

Stone walls remain firm.

Machinery several feet deep.

Scorched wooden beams.

PHOTOGRAPHS OF A FIRE IN A LANCASHIRE COTTON MILL.

One of the smaller rooms on an upper floor is known as the cotton chamber and is used for breaking up the cotton bales, and mixing the different classes of the fleecy-looking material. The upper rooms are heated to temperatures of from 80° to 100° Fahr., and the wooden floors contain oily and greasy matter which must be used to overcome excessive friction in the moving parts of the machinery.

When, therefore, once a fire does break out there is ample opportunity, unless it should be very smartly subdued, of making very rapid, aye, even lightning, progress, and of sweeping with its lambent flames through one of these large rooms so full of inflammable material, in the space of a few seconds. A minute is sometimes quite long enough to imperil a whole room of 12,000 cub. yds.

The starting-point is generally in one of the upper mule-rooms, and at a spot well-known to the workers for its occasional treachery in throwing out sparks where they are most dangerous. This locality is in the headstock of the mule. The motions of some of the parts of this headstock are extremely rapid, the pulleys making 750 r.p.m. and having rim velocities of 12 yds. per second. It is not to be wondered, then, that when a speck of dirt or hard, flinty material hinders this rapid motion the instantaneous friction thus set up immediately produces a spark. This spark touches the nearest fibre or thread, then several fibres and threads become involved and soon the room falls a prey to the greedy, devouring flames. Buckets of water are provided; fire-hose is there; extinguishing appliances are near at hand; but it too often happens that the fierce rapidity and voracity of the flame baffles all efforts and cannot be quenched.

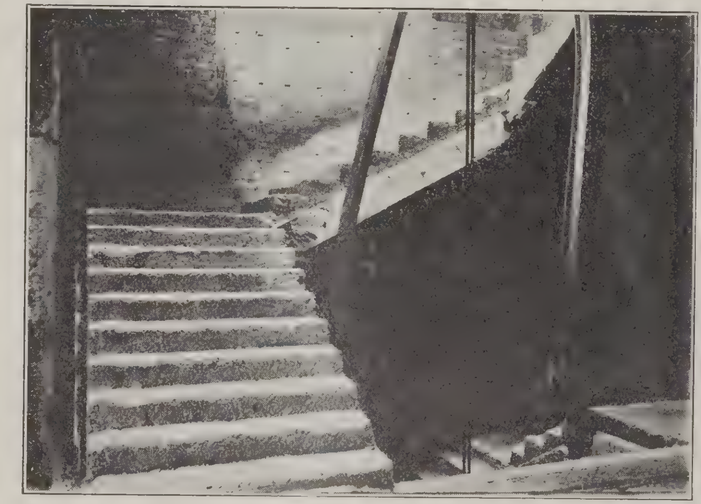
TELEPHONE FIRES.

We have from time to time referred to the serious hazard of fire at the offices of the telephone companies, and illustrated fires both in London and Glasgow, and of course we would add that, apart from the hazard to employees, there must necessarily be a risk to consumers, and above this also the possible inconvenience through fires that requires consideration. Having regard to what we said previously, we think it advisable to here give the summing up of Dr. Waldo and the verdict of the jury regarding the recent telephone fire.

The London Fire Inquest Act has been a boon to the Metropolis as far as fires in the City area are concerned, and it is only regrettable that the Inquest Act does not apply to the London County Council's areas and, as a matter of fact, to the United Kingdom generally. What a simple Act of this kind can do if administered by so able a coroner as Dr. Waldo is obvious, and, apart from any question of fire-prevention, there can be no doubt that the possibility of fire inquests being held in connection with any fire occurring in the City area must do much to reduce the possibility of incendiarism.

Summing up at the Inquest.

Dr. Waldo, in summing up, said that, for convenience sake, the two inquests might be taken together, although the premises were some distance apart. It was not disputed that both fires arose simultaneously from the same cause. Two important points were involved in the enquiry—the structural safety or otherwise of the premises as regards the risk of fire and the escape of occupants, and the special electrical conditions that gave rise to the fire, and the lack of powers to regulate the telephone service with a view to preventing the danger to property and life arising from similar accidents in the future. Being of comparatively modern introduction, telephone systems appeared to have remained hitherto outside any official control. The facts of the fires were simple. Early on the morning of February 28th a fire was discovered at Mansion House Chambers—at about five minutes to 2 a.m. The facts of the fire in Oxford Court, Cannon Street, were somewhat more complicated, as there was some danger to life, and there were several defects. The fire was discovered at 2 a.m. by the housekeeper and his wife, who heard crackling in an adjoining room, known as the distributing room. The husband gave the alarm, but, owing to some confusion between the two fires, there was some delay in the arrival of the fire brigade. The fire, however, was confined to the upper storey and the cables and the derrick on the roof above. The distributing room was lined with matchboarding, and the floor was of wood. The distributing room was full of electrical cables, and it was for the jury to say whether it was desirable to have appliances of that kind in a room with wooden walls and floors. In both fires the place of origin was clear; nor was there any doubt that the cause of the fire was an accidental contact of the telephone cables laid along the tunnel of the District Railway at Westminster Bridge.



A CONCRETE STAIRCASE AFTER A FIRE.

The electrification of the line required that the cables should be protected from possible contact with the railway current by being lodged in troughs. That work was handed over to the District Railway Company. The cables had been removed from their former position, and were to be placed permanently along the front of the platform, where they would be covered in. At the time of the fire the cables were lying on the ground, and a metallic cover, such as was used for covering the cables, appeared to have established a contact between the cables and the conducting rail of the line. Subsequently, when in the course of certain experiments made by the railway engineers a current of 550 volts was sent through the railway system, it formed an arc with the cables which carried 24 volts only, and more or less of the 550 volts were transferred to the National Telephone Company's system, with the result that parts of the connecting and conducting apparatus fused at the premises in Mansion House Chambers and at Oxford Court. The fire in Oxford Court revealed structural defects that might lead to loss of life in the case of a fire in the daytime. The position was rendered more perilous by the fact that the sleeping room was separated merely by wooden partitions from the large collection of electrical cable passing through the distributing room. That state of affairs was beyond the control of the London Building Act, 1894, which was not retrospective. The Act came into force on January 1st, 1895, some time after the Oxford Court premises were built. There were no means, therefore, of compelling the owner or owners to provide safety exits in the event of fire. The fire furnished another illustration of the urgent need of additional legislation such as that contained in the City of London (Means of Escape from Fire) Bill before Parliament. The question naturally arose whether the passage of a high-tension current of such great strength as that derivable from contact with the current of 550 volts might not be dangerous to anyone using the telephone at the time. Mr. Clay said that there was no danger because the wires would be at once fused, and so the current would be stopped. Mr. Alfred Bennett (telephone engineer to the corporations of Glasgow, Hull, Portsmouth and Brighton, and the States of Guernsey) had said that, in his opinion, operating should cease during thunderstorms, and that the Exchange should be fitted with the safety devices. Obviously, it would be unwise to subject persons who used the telephone to powerful currents, to say nothing of the risk of fire from fusion of wires.

The Jury's Verdict.

The jury found that the fires originated at the National Telephone Company's premises at about two o'clock on the morning of February 28th. The fires were caused by the contact of the company's cables with the conductor rail of the District Railway Co. at Westminster. There was not sufficient evidence to show whether the cause was accidental or due to negligence. Telephone wires should not be allowed near high-tension currents unless properly protected. Contact of a telephone wire with a high-tension current was not likely to be dangerous when properly protected, and with the same proviso there was not likely to be fire, or shock to subscribers. They considered that the construction of the test and distributing rooms showed great room for improvement. Greater use should be made of non-combustible material. Safety devices should be fitted in all exchanges. Special powers were required to regulate all structural and other powers connected with the telephone service. The jury saw no necessity for a Government enquiry into telephone risks and needs. They did not think the Oxford Court premises were satisfactorily provided with means of escape from fire.

CONCRETE FOR STAIRCASES.

We dealt in a previous supplement at length with the interesting fire at Glasgow, in Messrs. Wylie, Hill & Co.'s premises. We have now obtained a photograph, by the courtesy of Mr. Ellis Marsland, of the concrete staircase in that building as it appeared after the fire. Considering that the building had its entire contents burnt out, and that the contents were of a highly inflammable character such as is generally met with in a drapery stores, the photograph we present is certainly a remarkable one, as showing how concrete construction will withstand a great volume of flame up a staircase shaft, the staircase being stripped of its wood treads and risers, but otherwise remaining intact.

The Association of Professional Fire Brigade Officers held its annual meeting at Bradford last week, when C.O. Scott of that city was elected president for the year.

THE

BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

June 14, 1905. Vol. 21, No. 540. 6, Great New Street, Fetter Lane, E.C.

Summary.

From the business and commercial point of view, the modern system of division of labour has a good deal to recommend it; but each worker becomes a mere "segment," his whole life and thought cut up into parts: he becomes mechanically perfect in his part, but its relation to all other equally important parts is ignored. (Page 331.)

The extensive restoration of the Chateau of Saint-Germain-en-Laye, near Paris, is now being completed. The object has been to give it its original sixteenth-century appearance, as it was left by François I. (Page 328.)

The most effective screen for purifying and humidifying the incoming air in the plenum system is the mist screen, which consists of a brick chamber wherein water is fed on to a revolving copper fan, which distributes it as mist. (Page 337.)

The great east window of St. Margaret's, Westminster, is to be restored by Mr. Kempe, and the east wall advanced a little, at an estimated cost of £3,000. (Page 336.)

There is a marked contrast in the methods of burning gypsum abroad. Most of the American rock is calcined in kettles by direct heat. The French plaster manufacturers have invented a variety of kilns and methods. (Page 335.)

The Birmingham Builders' Exchange is to opened on June 29th. A collection of catalogues of all the leading firms connected with the building trade is being made. (Page 334.)

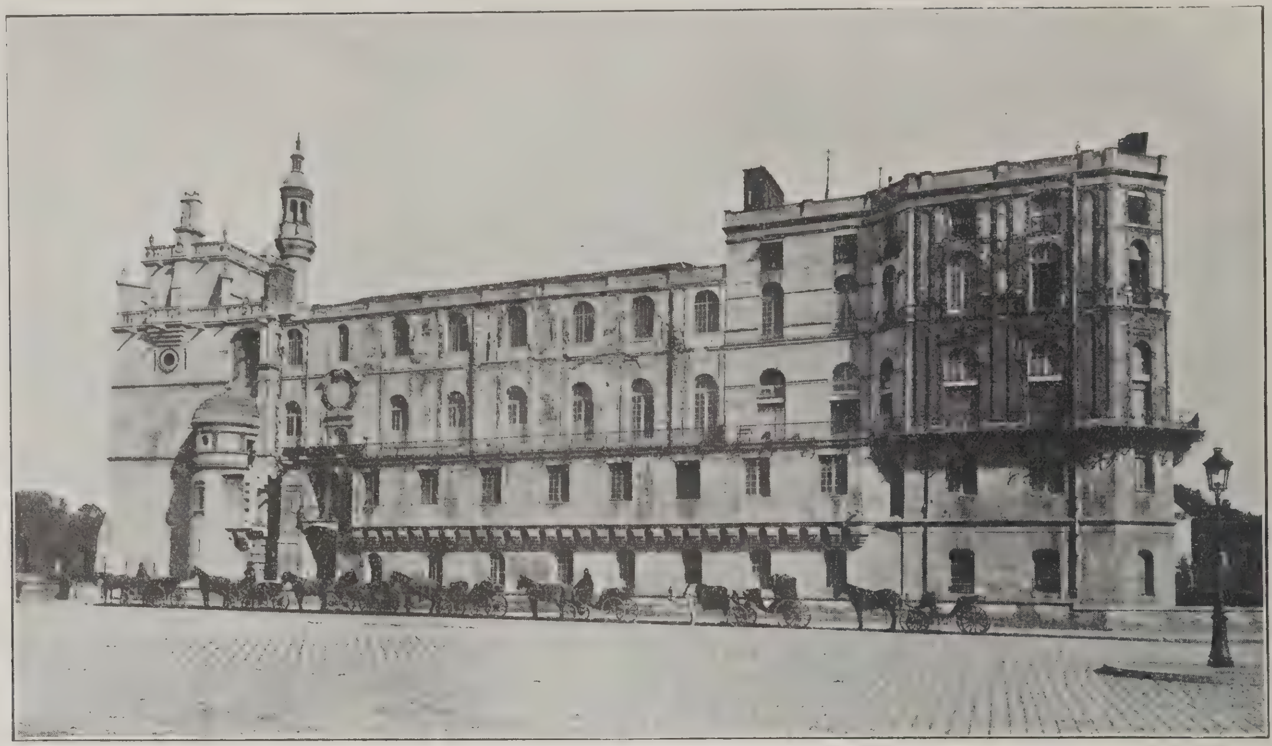
Messrs. Lanchester & Rickards have been selected for the Wesleyan Church House to be built on the site of the Westminster Aquarium. The estimated cost is £140,000. (Page 338.)

The proportions of concrete adopted in American practice for use in the tallest skyscrapers are 1 part Portland cement, 3 parts sand and 6 parts broken stone. (Page 336.)

Messrs. Holloway Brothers' contract for the third extension of the Admiralty buildings is to be completed by May 1st next year. The penalty for delay is £100 per week. (Page 338.)

The Charge against Mr. Bodley. In our issue of April 19th last a correspondent called attention to the restoration proposals of Mr. G. F. Bodley, R.A., at York Minster, and the charges have just been repeated in the "Times" by Mr. Thackeray Turner, secretary of the Society for the Protection of Ancient Buildings. Objection is made to the erection of new flying buttresses on the north side of the nave, and Mr. Turner calls attention to the fact that the nave is vaulted over with wood groining in imitation of stone, which, he says, "gives practically no outward thrust upon the walls, but it is clear that the original builders contemplated putting up the vaulting in stone, because they made provision for flying buttresses. It is these contemplated buttresses which the authorities are proposing to build. Much mischievous renewal has gone on at York Minster for many years past. Now, however, the restorer is not cutting away ancient work and putting new in its place, but putting up new work on the supposition that it was once there. As there is no stone vaulting, the weight of these new flying buttresses will thrust the walls together, and we gather that to meet this thrust it is intended to brace the walls so as to make them capable of withstanding the pressure of the new flying buttresses." Mr. Bodley's reply to criticism is contained in a letter to the Dean of York, in which he says: "Flying buttresses are for the strengthening of the walls of the clearstory. Though at the Minster there is no vaulting, yet a roof of so wide a span has a thrusting influence outwards. Flying buttresses, steadied by the weight of pinnacles pressing down, resist thrust and keep the walls in order. That is the use of flying buttresses. They strengthen and resist outward pressure. Mr. Green reports that the thrust of the roof is telling very distinctly on the clearstory walls, which are already out of the perpendicular. The great height of these walls renders them weak and makes the addition of the flying buttresses most desirable." The question is somewhat difficult of solution, because the builders intended to use stone vaulting but feared to do so and put up instead a sham in wood, which was renewed about the middle of the last century after a fire. If it were possible to erect a stone vault this would be the best thing to do, but apparently it is not. If, as Mr. Bodley states, the walls of the clearstory are being thrust outwards they must be buttressed. The buttresses, if proportioned to this thrust, would only be light, but if this were done they would not be similar to the others on the building and being proportioned by a sham would look wrong. The interior roof is a sham, and it seems that it must lead to further deception. The moral is obvious. It would have been better to have frankly admitted the weak building originally and have used a simple open-timber roof.

Competitors' Estimates. In view of the fact that building committees are as a rule so dominated by questions of expense, it can hardly be considered that the usual method of asking competitors to state the cost of their designs is satisfactory. Every one is familiar with those "cooked" estimates which work out the cost of the building so nicely, just about the figure stipulated by the promoters, and everyone also knows how in many cases the actual cost of the building far exceeds the competitive architect's estimate. This is especially the case in complex designs, such as those for municipal buildings, where fittings comparatively insignificant in themselves total up a very large item; in which case it is especially noticeable how the competitor with little or no experience of the actual carrying-out of a design such as he submits clearly shows his ignorance of what the real cost of the work is likely to be. It would often be a better plan if the conditions required competitors to state, not the estimated cost of their design, but only the cubical contents and general finishing. The assessor could then determine what price per foot cube to put it at, instead of each competitor doing this for himself, with the result that the total cost which is very satisfactory when worked out at 7d. is an utterly false estimate when the actual price might be 9d. per ft. cube. The question of cost has a far more important bearing on the standing of the architectural profession than seems to be imagined. When the estimated cost is so generally exceeded and extras on the contract ate so frequent, is it surprising that architects are distrusted and that local bodies get their surveyors to design and carry out buildings? It is useless to call on individuals, but assessors are independent and could counteract some of the mischief.



CHATEAU OF ST. GERMAIN: THE UNRESTORED WEST FRONT.

THE CHATEAU OF SAINT-GERMAIN-EN-LAYE.

By F. H. CHEETHAM.

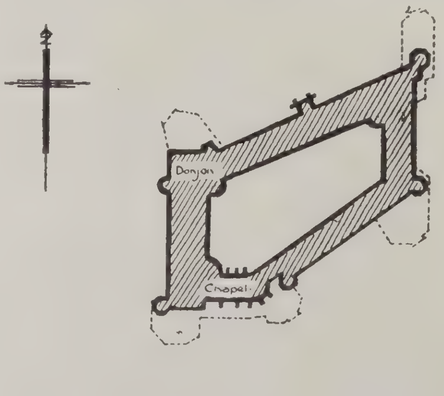
SINCE 1862 the château of Saint-Germain-en-Laye has been undergoing a restoration, or rebuilding, of that thorough type with which we are familiar in France. The work is not yet complete, though within measurable distance of the end, the last portion being now in the hands of the builders.

The condition of the château before the work was decided upon was such as justified a very drastic treatment, the original edifice of François I. having been disfigured in the seventeenth century by the addition of huge ugly blocks of brick and stone at the angles of the building, which entirely robbed it of its real character and hid many of its most conspicuous merits. The usages also to which the château had been put during the time of the Revolution and in the subsequent years of Empire and Monarchy had left the interior in a sad state of repair. The decision, then, to turn the château into a museum necessitated a thorough reconstruction within and without.

The architect charged with the restoration in 1862 was M. Eugène Millet, a pupil of Labrouste and Viollet-le-Duc. He is known also as the designer of the church of Paray-le-Monial and the Chapelle Saint-Gilles, at Troyes. But his greatest work is the restoration of the château of Saint-Germain. Unfortunately, M. Millet did not live to see the completion of the work, dying in 1879. His drawings for the complete restoration will be found in Sauvageot, and his designs have been more or less faithfully followed. M. Millet was succeeded by M. Paul Lafollye, and since 1896 the architect in charge of the rebuilding has been M. Daumet, Inspecteur Général Honoraire des Bâtiments Civils. The object of the reconstruction has been to restore to the château its original sixteenth-century appearance, as it was left by François I., and this has been most admirably done. It is, of course, very largely new work, but it is frankly so. The additions made by Louis XIV. have been swept away and their materials scattered. The present writer on visiting Saint-Germain came across an advertisement of a sale by auction which had been held in October, 1902, of "Materiaux de demolition provenant du Château National de Saint-Germain-en-Laye," and these were announced to consist of "beams, joists, rafters, firewood, joinery, doors, casements, shutters, casings, panels, faïence, marbles, etc."

The château of Saint-Germain was built by François I. on the foundations of an older building, from the designs of Pierre Chambiges. Of this older building the chapel and the donjon were retained and skilfully incorporated in the château. The plan therefore follows the lines of the Gothic fortress or castle, and something of the sternness of a mediæval building found expression in the outer elevations. Du Cerceau, speaking of the irregular plan of Saint-Germain, says of the courtyard that it is of "assez sauvage quadrature."

Robert the Pious is said to have erected a monastery in the forest of Laye in the eleventh century in honour of Saint Germain, bishop of Paris. About a hundred years later, in a donation of Louis VI. to the monastery, there is mention for the first time of a royal château. This presumably stood on the site of the present building, and was probably built by Louis himself. It is stated to have possessed a donjon, chapel, moat and enceinte. Philippe-Auguste resided here on several occasions between the years 1189 and 1222. Louis IX. also frequently came to Saint-Germain, and to him we owe the chapel. Viollet-le-Duc speaks of this as "one of the most characteristic examples of the art of the thirteenth century at the moment of its splendour," and Sauvageot calls it "one of the joys of Gothic architecture."



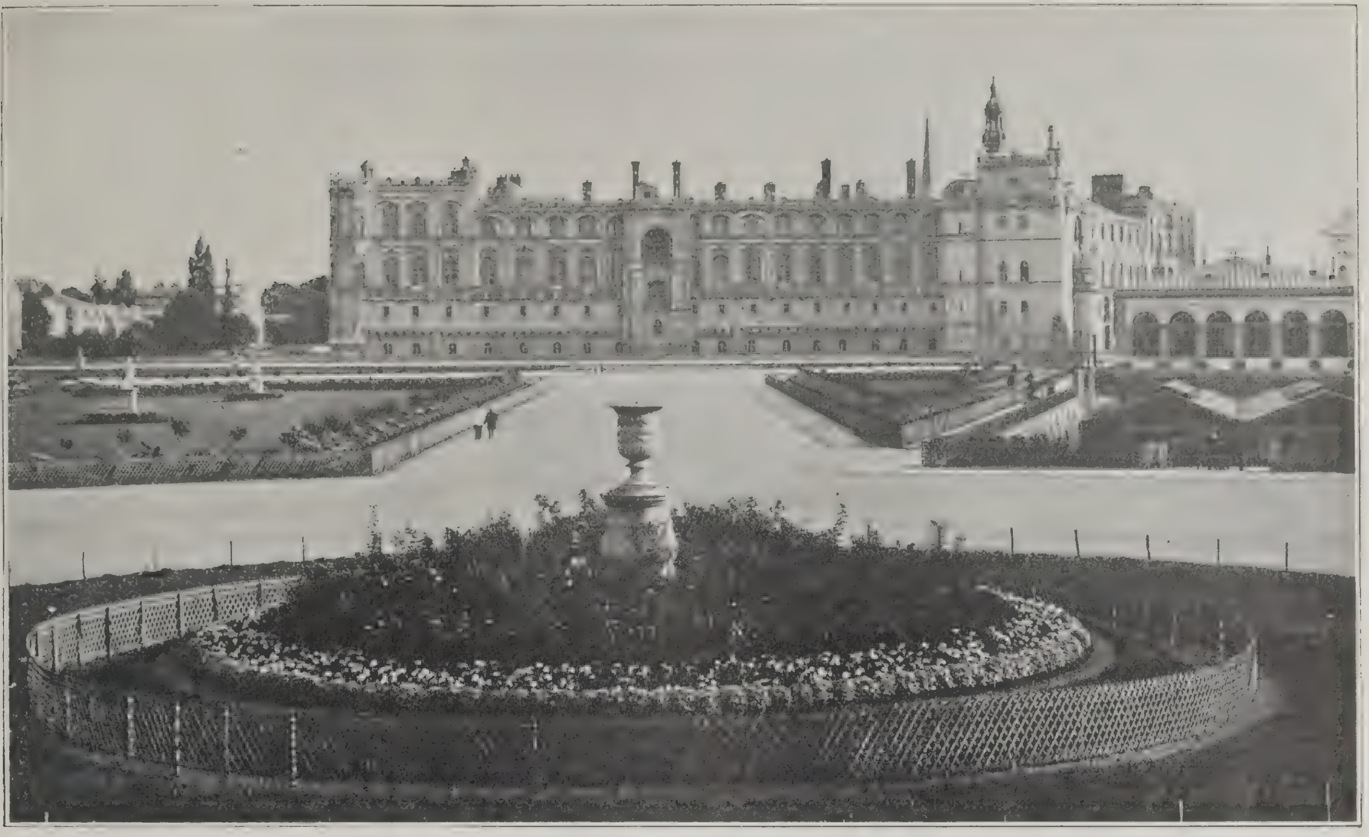
· Dotted lines show additions in 17th Century (now demolished)

In 1346 the château of Saint-Germain was burnt by the English at the beginning of the Hundred Years' War, but the chapel escaped. Twenty years later, in 1366, Charles V. commenced the rebuilding of the château, but of the nature of this rebuilding little is known, the donjon at the north-west angle of the building being all that was left of it in the reconstruction of François I.

François I. may be considered as the real creator of the château of Saint-Germain. "Finding the situation pleasant," says Du Cerceau, "François pulled down the old building, without, however, touching the foundations, and rebuilt the whole as we now see it." The work was commenced in 1539 by Pierre Chambiges, and advanced so rapidly that at the death of the architect in 1544 nearly the whole of the building was at the roof level. Chambiges was succeeded by his son-in-law, Guillaume Guillain, who carried out Chambiges' design and finished the work in 1548. These are the dates given by M. Léon Palustre. At the time Sauvageot wrote (1865) it was still thought that Saint-Germain was the work of Italian architects, and M. Millet in his report of 1862, while stating the opinion of Félibien that Serlio was the architect of Saint-Germain, qualifies the statement with his own remark that "we do not know whether there is any foundation for such an assertion, for very often in France Italians are given the credit of magnificent works which were the product of French artists." Still, he admits that "it would be difficult to deny the influence at Saint-Germain of foreign artists."

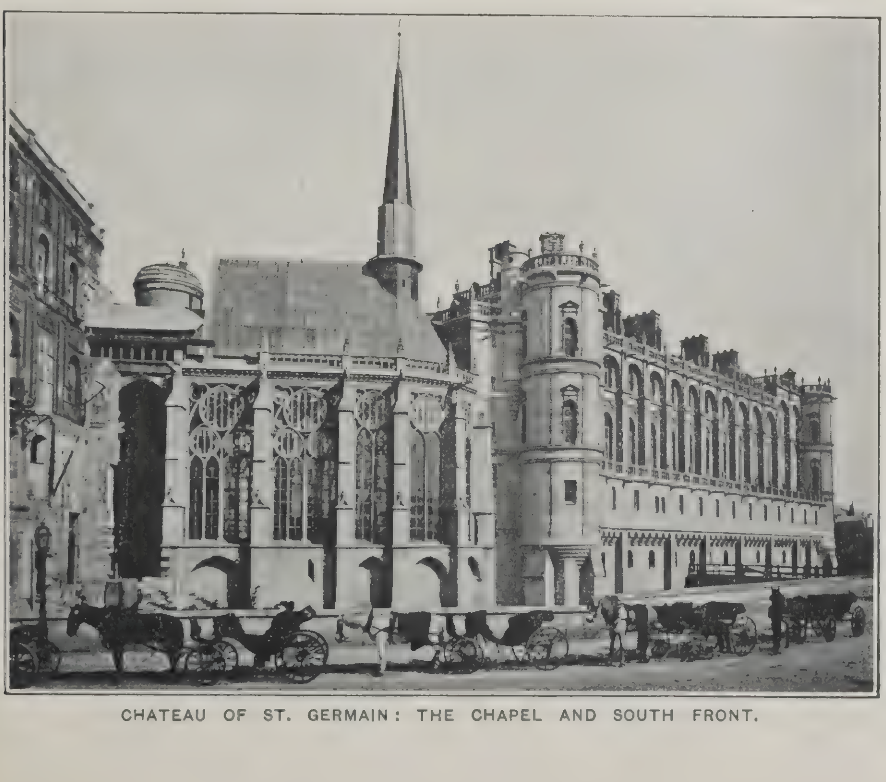
"Modern discoveries," writes M. Léon Palustre, however, "have not been favourable to those who were pleased to see everywhere the hand of the Italian. Where even some uncertainty was permissible, the balance has been found to be on the side of the native artist. The place that Fra Giocondo, Primataccio, and so many other unduly occupied in our history, has been given up to the victorious French artists. On this point there is not to-day, and can no longer be, any disagreement."

Francois I. died in 1547, and therefore did



CHATEAU OF ST. GERMAIN: THE NORTH FRONT.

not live to see the château completed. Henri II., finding it too much like a fortress and wishing for a more luxurious residence, commenced the new château, a vast palace which occupied the site of part of the existing terrace. The new château was finished by Henri IV., and all that remains of it is the pavilion that now bears his name. Louis XIII. resided at the new château during a long portion of his reign; there he died, and there his son Lóuis XIV. was born. Louis XIV., however, took back the court to the old château, deserting the new palace, which had been built too quickly and was already showing signs of instability. Louis XIV. added the five great projecting pavilions at the angles of the château which did so much to destroy its original character, and the last of which has only quite recently been demolished. Sauvageot tells us, however, that Louis XIII. had already made some modifications "assez graves" in the building, and by additions and suppressions had altered the Gothic character of the chapel. The additions of Louis XIV., which were the work of Jules Hardouin Mansart, and which Sauvageot characterizes as "truly deplorable," were commenced in 1682, just about the time Louis finally quitted Saint-Germain for Versailles. To Louis XIV., however, we owe the construction of the magnificent terrace and the parterre to the north of the château, both the work of Le Notre.

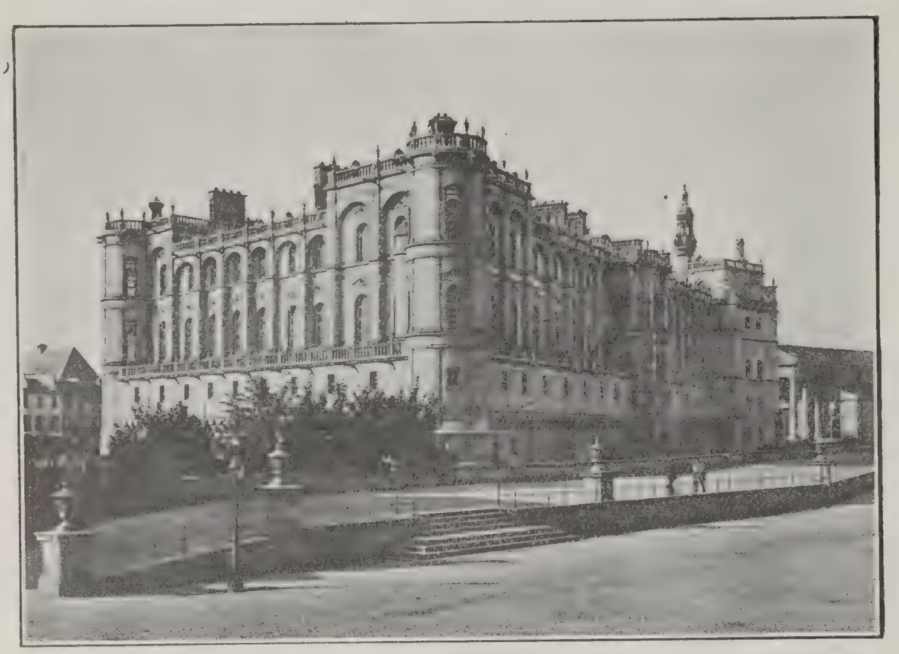


CHATEAU OF ST. GERMAIN: THE CHAPEL AND SOUTH FRONT.

After the departure of Louis the château became the residence of James II. of England, who died there in 1701. During the greater part of the eighteenth century Saint-Germain continued to serve as a place of asylum for the friends and companions of the exiled Stuarts. The Revolution turned the building into a prison; the Empire used it as a cavalry school; the Restoration as a barrack; and from 1836 to 1855 it served as military penitentiary. Napoleon III. resolved to restore the château, and by a decree of November 8th, 1862, established there a museum of Celtic and Gallo-Roman antiquities.

It will be seen, then, that the present building comprises the ancient foundations, the chapel of Saint Louis, the donjon of Charles V., and the palace of François I. Its irregularity will be observed in the block plan on the opposite page. The great terrace of Saint-Germain lies at some distance to the east of the château, which has Le Notre's garden on the north, and the streets of the town on the west and south.

Saint-Germain has not the outward characteristics of a French château of the Renaissance. We seek in vain for the high pointed roofs and the graceful detail of ornament to which our eyes are accustomed. Something of its Gothic origin has been preserved in its exterior elevations. The lower of the three storeys, rising from the moat, is built entirely in stone and has a massive appearance. A line of corbels forming machicolations supports a projecting passage around the whole of the building at the level of the entresol. The wall finishes above in a balustrade and balcony at the level of the first-floor windows. The upper part of the château is built in brick and stone, the walls terminating in an open balustrade with vases. The roofs, a series of flat terraces in lias, are not seen. "It is interesting to trace the same peculiarities in all Chambiges' work," says Miss Rose Kingsley, "the use of brick for ornament, while the *massifs* of the wall are in stucco or stone. We see it in his portion of Fontainebleau, the cour du Cheval Blanc. At Saint-



CHATEAU OF ST. GERMAIN, FROM THE NORTH-EAST.

Germain it is used not only on the exterior but in the interior. This inversion of the use of stone and brick is a mark of all the châteaux built by Chambiges, Fontainebleau, Saint-Germain, La Muette, Challuau." The long monotonous lines of the front are broken by the corner pavilions, but these have very little projection, the idea apparently having been to afford as wide a view as possible from all parts of the château of the magnificent panorama around Saint-Germain. The absence of high roofs may be due to the same cause, the desire to obtain a promenade at the highest point of all from which the view could be best enjoyed. These roof terraces, as they were called, were supported by brick vaulting on the second floor, and the use of iron ties in the construction was one of the causes which led to the adoption of the theory of the Italian origin of Saint-Germain. "It is easy to see, however," says M. Palustre, "that allowing for the height at which the vaults are placed, the width of the building (12 metres), the enormous weight of the terraces, and the impossibility of finding a point of support outside, the method adopted was the only one to pursue."

The interior elevations to the courtyard are less severe and perhaps more original. The brick pilasters become, by their greater projection, something approaching "sturdy buttresses" (Sauvageot). These divide the whole of the courtyard elevations into so many bays, the buttresses being connected at two levels by brick arches. A balustrade runs round the courtyard at the level of the first floor and above the entresol, and another balustrade crowns the walls as on the outer elevations. Three of the angles of the court are occupied by circular staircase towers terminating in domed roofs of stone.

The south-west corner of the courtyard is occupied by the chapel of Saint Louis. On this side a storey has been added to the wall of the chapel above the eaves of the roof, to make it "harmonize" with the sixteenth-century work on either side. The chapel consists of four bays and an apse. The windows occupy the whole space between the buttresses, and are thus square-headed. The tracery, however, takes the form of a pointed arch, the spandrels being filled in with trefoils. "The chapel of Saint-Germain," says Viollet-le-Duc," is peculiar in this: its style is not that of the Royal Domaine, but is derived from the schools of Champagne and Burgundy."

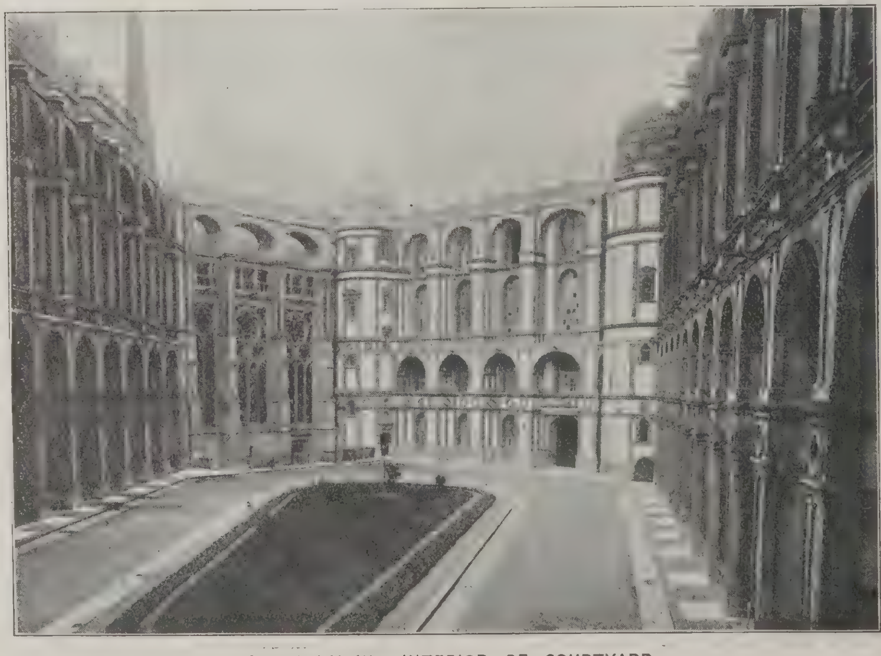
"The five pavilions added by Louis XIV.," says M. Millet, "deranged all the harmony of the old dwelling. They have not the monumental character of the buildings of François I." The immense projection of the pavilions entirely spoiled the magnificent views from the windows of the château, and their great shadows darkened its walls. The buildings themselves seem never to have been properly completed; there were floors without staircases, access to which was obtained only by very steep steps like ladders, of unmistakable temporary character. The building of these new pavilions caused much damage to the old work of Charles V. and François I., to which they were attached. Even the chapel, as will be seen by the dotted line on the block plan, was hidden on the south side (the side now facing the Rue du Château Neuf) by the erections of Mansart. There was, therefore, nothing to regret in the disappearance of this seventeenth-century work.

The restoration of the chapel is now completed. The floor, which had been raised to the level of the ground in the courtyard (thus destroying the proportion of the interior), has been lowered to its original level, and the chapel itself is now used as part of the museum. The "restoration" is thorough, and at present is rather too new to please.

Saint-Germain has been described as a happy mixture of brick and stone. The ornamental use of brick is as conspicuous a feature inside as out, and has been made the most of in the restoration. There are many good brick fireplaces besides the great one in the Salle des Fêtes. The bricks in most of these fireplaces measure 8¾ins. by 2¼ins., and the joints are ⅜in. wide. Throughout the building the Fleur de Lys, the salamander (badge of François I.) and the initial F are freely used. The lock-plates of the doors take the form of a crowned F, the keyhole being in the lower member. The top storey of the château is vaulted in brick, with stone ribs, the members of which are picked out in red. On the balcony in the projecting block of the grand staircase have been placed two admirable equestrian bronzes by Fremiet, representing a Gaulish chief and a Roman horseman, in reference to the character of the museum. As to the museum itself, few archæological collections can compare with it for interest and value—a value much enhanced by its possessing a very excellent "catalogue raisonné," prepared by M. Salomon Reinach.

There are seventeen plates descriptive of the château of Saint-Germain in the second volume of Sauvageot's "Palais, Châteaux, Hôtels, etc., de France," and sixteen illustrations in the text. Many of these plates form the "projets de restoration" of M. Millet and represent the château pretty much as it is now.

The town of Saint-Germain-en-Laye lies thirteen miles west of Paris and is built on a hill on the left bank of the Seine, nearly 200ft. above the river. The view from the well-known terrace has often been described and is extremely fine. The terrace is nearly a mile and a half long and 100ft. wide, and is planted with limes and horse-chestnuts. The Château Neuf, of which the Pavillon Henri IV. is the only remnant, stood overlooking the river, with gardens stepping down the hillside in a succession of terraces. This insecure position, together with its hasty building, gave it but a short lease of life. Before Louis XIV. quitted it we hear of "peu de solidité" in the building. It began to fall to pieces, and, coming into the hands of the Comte d'Artois in 1776, he ordered it to be destroyed—a work which, however, only seems to have been completed by the Revolution.



ST. GERMAIN: INTERIOR OF COURTYARD.

SPECIALISM.

By R. H. T.

MANYSIDEDNESS is not always a mark of intellectual power, and is a characteristic rather of successful business men than of artists. The architect is called upon to exercise his skill in a variety of subjects. The modern building problems alone are sufficient to occupy the attention of any professional man if he wishes to be quite abreast of the day. He must know a little of various kinds of buildings—houses for the rich and poor, hospitals, asylums, schools, civic buildings, libraries, technical schools and laboratories. In addition, he has to be acquainted with many kinds of construction, comprising iron and steel, concrete or reinforced construction applied to various purposes, in addition to the traditional trades of the mason, bricklayer, carpenter, &c.; and the requirements of modern civilized life have compelled him to possess a knowledge of electricity in its many applications to building, for motive power, heating and lighting, and also of hygiene and sanitary science. He must also have a knowledge of building fittings and apparatus, such as those necessary for schools and laboratories, to enable him to apply his architectural skill economically in planning buildings. Mechanical cal plant is another thing about which he is supposed to know something if he is to design factories, engine-houses, central power stations and the like.

A Source of Weakness and Strength.

Now, this manysidedness of architecture has been a source at once of weakness as well as of strength: of weakness, because it has tended to divide the faculties and energies of the professional man and to divert them into different channels; and of strength, because we are shown the possibilities of modern architecture and how these various forces can be combined.

One of the main results of this multiform activity has been to divide the profession, and subdivision of labour is now one of the great economical forces of our time. It is the backbone and main factor in all the leading industries of the day; but how far the same principle is an advantage to an art is a question of importance.

In a large miscellaneous practice made up of building and architectural work, with branches of surveying, subdivision can be resorted to with good results, as one member of the firm can be engaged in the designing of buildings, other members of the staff in making engineering details, such as steelwork, and others on supervision, quantities and valuations; or in some large firms one member transacts the office routine and sees clients, while the other members supervize and conduct special branches.

Such a division facilitates business, just as in manufactures it is found economical. It may not be an ideal one for an architectural purpose, but it certainly enables better results to be achieved.

Architecture a Livelihood.

It is a matter of necessity nowadays that architecture be practised mainly as a means of gaining a livelihood—the man must "live to work"; it has to be practised as a business chiefly, as an art secondly. In America the custom of employing experts in the offices of large firms is common. These experts are engaged in designing constructional steelwork, special factories and plants. They are, in fact, designing engineers. The chief work is undertaken by specialists. The contractor is often a practical engineer who supplies all the details and supervision, or employs an engineer to look after the work. There the large financial load carried by the contractor has much modified the condition of things. Formerly the contractor could and would know about all that went on in the building. Nowadays he cannot execute his work single-handed; he sublets it, and the sub-contractors also sublet their obligations.

This house, for Mr. E. P. Musmann, is faced with Luton bricks, the balconies and porch being of Portland stone. In execution, extra rooms required led to variations of the tower, which is shown on the drawing as originally designed by the architect, Mr. George Hornblower, F.R.I.B.A.

Crumbs of Men.

But this division has not been productive of the best art work nor of the best architecture. Ruskin in his "Stones of Venice" says: "We have much studied and much perfected the great civilized invention of the division of labour; only we give it a false name. It is not, truly speaking, the labour that is divided, but the men—divided into mere segments of men—broken into small fragments and crumbs of life, so that all the little piece of intelligence that is left in a man is not enough to make a pin or a nail, but exhausts itself in making the point of a pin or the head of a nail."

Workers Apart.

If we look at the professional aspect of architecture, we shall see that it is composed of several different things, and those engaged in producing a building are divided men—that is, their interests and aims are very one-sided or restricted. Thus there is the man who designs the building, perhaps only a "ghost," and architecture which consists only of designing can hardly be called by that name; then there is the builder or engineer who carries out the construction—his interest and responsibility lie in making a profit, and therefore of taking a very partial view of the construction; then we have decorative craftsmen, who only work in their restricted ways, and are equally divided in their thoughts and sympathies. None of these divided men can produce architecture, for each of them is only working in his own narrow groove—only employing one of his faculties, while his eyes are closed to all others.

"Farming Out."

From the business and commercial point of view, then, the modern system of division of labour has a good deal to recommend it; but at the same time the personal factor is suppressed. The worker becomes a mere "segment"; his whole life and thought is cut up into parts, and he only uses one of those parts in his work. He becomes mechanically perfect in his part; but its relation to all other equally important parts is ignored. There is a want of sympathy between the several portions of the work, simply because each craftsman has only done his best in his own way without considering his brother-craftsmen's part. And this discordance of aim is often seen in a building designed by one man, contracted for by another, and executed by several different craftsmen or sub-contractors.

As long as the modern contract system lasts in which there is a nominal designer who is paid a percentage on the cost, and a contractor who has to "farm out" the work to several separate tradesmen who have no personal interest in or responsibility for the work, we can hardly expect anything better. The whole is no more than a business transaction, in which the large professional firm makes a profit.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Books on Building Construction and Quantities.

CHESTER.—G. M. writes: "Please name a good book on the first stages of building construction and builders' quantity surveying as a preliminary to attending a technical school during the winter months for these subjects, and also with a view to making myself efficient as a builder's quantity surveyor on a small scale."

Longman's "Notes on Building Construction" Vol. I. (9s.), "Specification No. 8" (3s. 3d.), and Davis's "Quantities and Quantity Taking" (4s.). These books can be obtained post free from our offices for the prices stated.

Tenterden Church, Kent.

LEYTONSTONE.—STUDENT writes: "Is Tenterden Church, Kent, a suitable subject to measure? Also, are there any architectural examples worth sketching in the surrounding district?"

Tenterden Church has rather a shabby external appearance. Most of the original tracery of the aisle windows has disappeared, though now restored. The church has a beautiful lofty fifteenth-century tower. The aisles to the chancel have curvilinear windows, some being especially fine. Other churches in the district are Bevenden, Biddenden, Frittenden, Cranbrook, Sandhurst, Rolvenden, Headcorn and Hawkhurst, the last possessing a very fine five-light curvilinear window in the east end. L. G. R.

Churches to Measure in the Lake District.

HUDDERSFIELD. — PROBATIONER writes: "Please name a few churches in the Lake District suitable to measure for the R.I.B.A. intermediate examination."

Crosthwaite, Bolton Gate, Distington and Wythburn, all Perpendicular churches, would supply material for one of your measured drawings, but as far as can be ascertained in London there are no thirteenth- or fourteenth-century churches in this district. L. G. R.

Brickwork Pointing.

JOINTER writes: "A large house is erected in an exposed position by a builder, with red bricks of fair quality supplied by the building owner, who desires them to be tuck-pointed, with a white joint. The brickwork is washed down in the usual way with Venetian red colouring containing copperas, stopped and tuck-pointed, the joint being ironed in the stopping. The front of the house, which faces the exposed side (south-west), after having been built six months, looks very poor, owing to the rain having washed the colouring out of the bricks and quite discoloured the white putty joint, although the joint is still intact. The three remaining sides look well. Can the builder be compelled to repoint the front in consequence, or do you consider the discoloration will stop and the white joint show better in course of time?"

The work has not been properly done, and it is doubtful whether the white joint would show better in time; in any case it would take a considerable period to do so. The mistake was in not using a binding material with the red pigment. Green copperas is used for colouring stock brickwork, decomposing on exposure to the air into yellowish-brown hydrated iron-oxide; it is washed away by rain to a certain extent, only being retained by the absorption of the brick, but it has no real binding action. It would be better to use a dilute solution of water glass as the binding agent, or one of the washable distempers (these have casein, linseed oil and lime as their binders).

Contract Drawings.

HALIFAX. — WILLIAMSON writes: "Are signed finished coloured plans in pencil binding as contract drawings? When time has been limited I have allowed this."

Yes.

The Glasgow Exhibition.

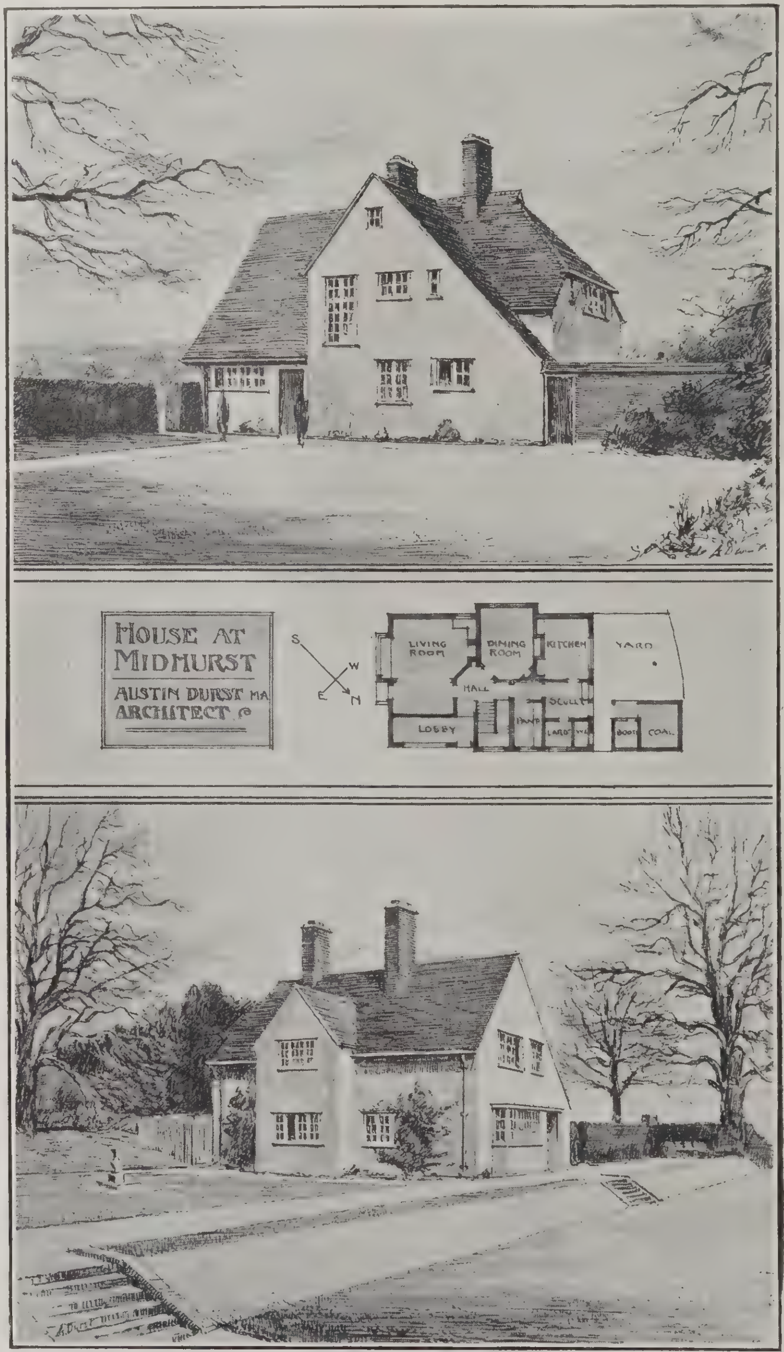
EDINBURGH.—ARCHITECT writes: "Where can I find illustrations of the architectural work in connection with the Glasgow Exhibition of 1901?"

See our issues for May 22nd and 29th, 1901, and the "Architectural Review" for June and August, 1901.

Water-supply to House.

M. S. writes: "We have taken a house on a three years' agreement, commencing from December last, on the understanding that the water would be laid on from the main about the beginning of February; but this has not been done yet. In March the agent said it would be done in a day or two; the landlord also said it would be done shortly. As there are still no signs of it being laid on, we have written to the district council and have received an answer to the effect that the plans and estimates are in London awaiting the sanction of the Local Government Board, without which the work cannot proceed. We have a flushing drain, and no water on the premises. Can we be compelled to stay under these insanitary conditions? We have a rainwater tank, but get very little from it, and all water has to be fetched from the agent, who is a neighbour."

If you can prove the facts you state, we



This house was built at a cost of about £1,000, with 11in. hollow walls of local Sussex bricks, cement rough-cast. The tiles are hand-made and also local. The dining-room is panelled in sequoia, with mother-of-pearl inlay. On the ground floor the boards, treated with "Carbolineum," are laid direct on the concrete. The garden was planned with the house to suit the site, and had the advantage of some fine oaks on the northern boundaries. The work was carried out by Mr. H. C. Deane, builder, of Midhurst.

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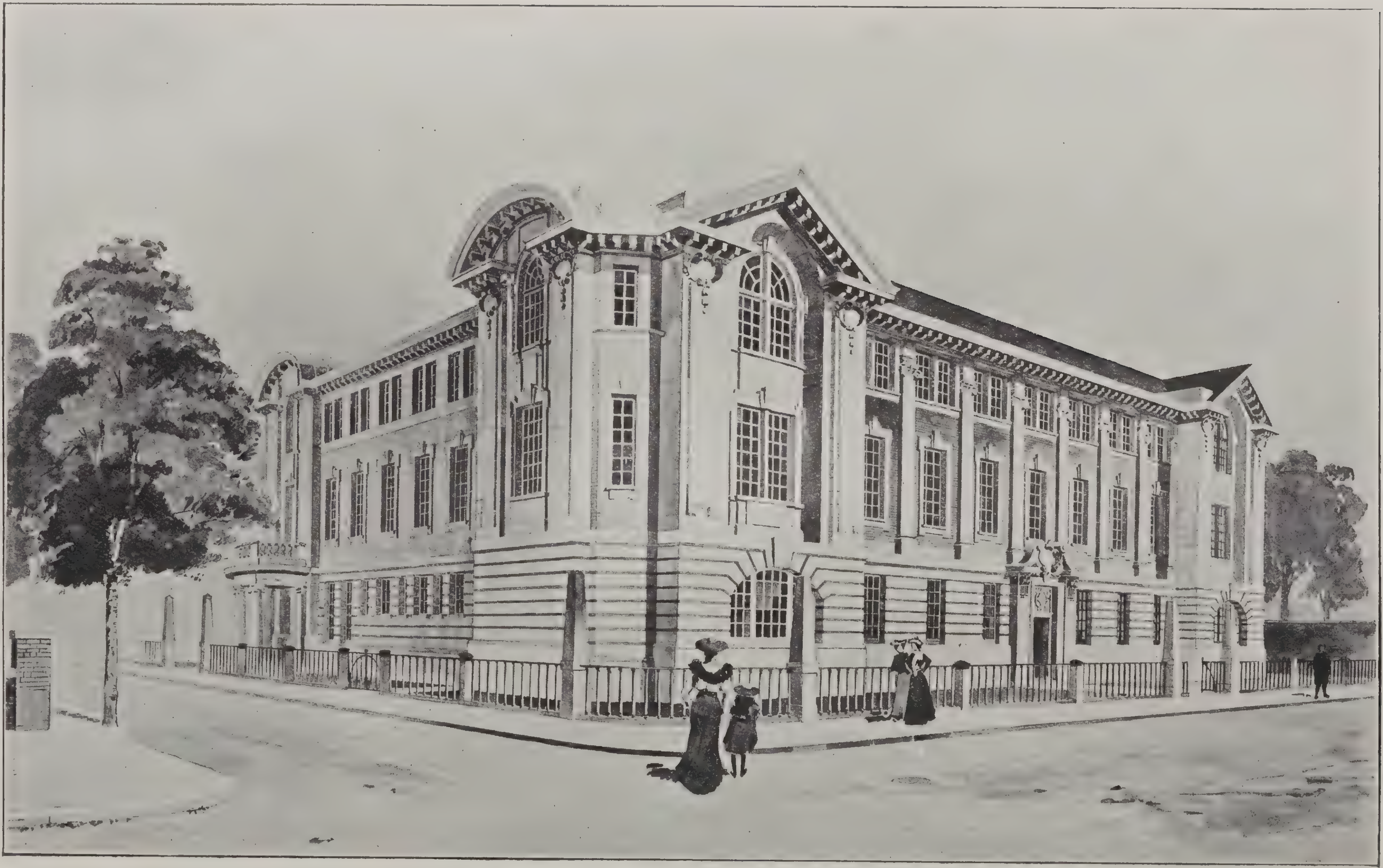
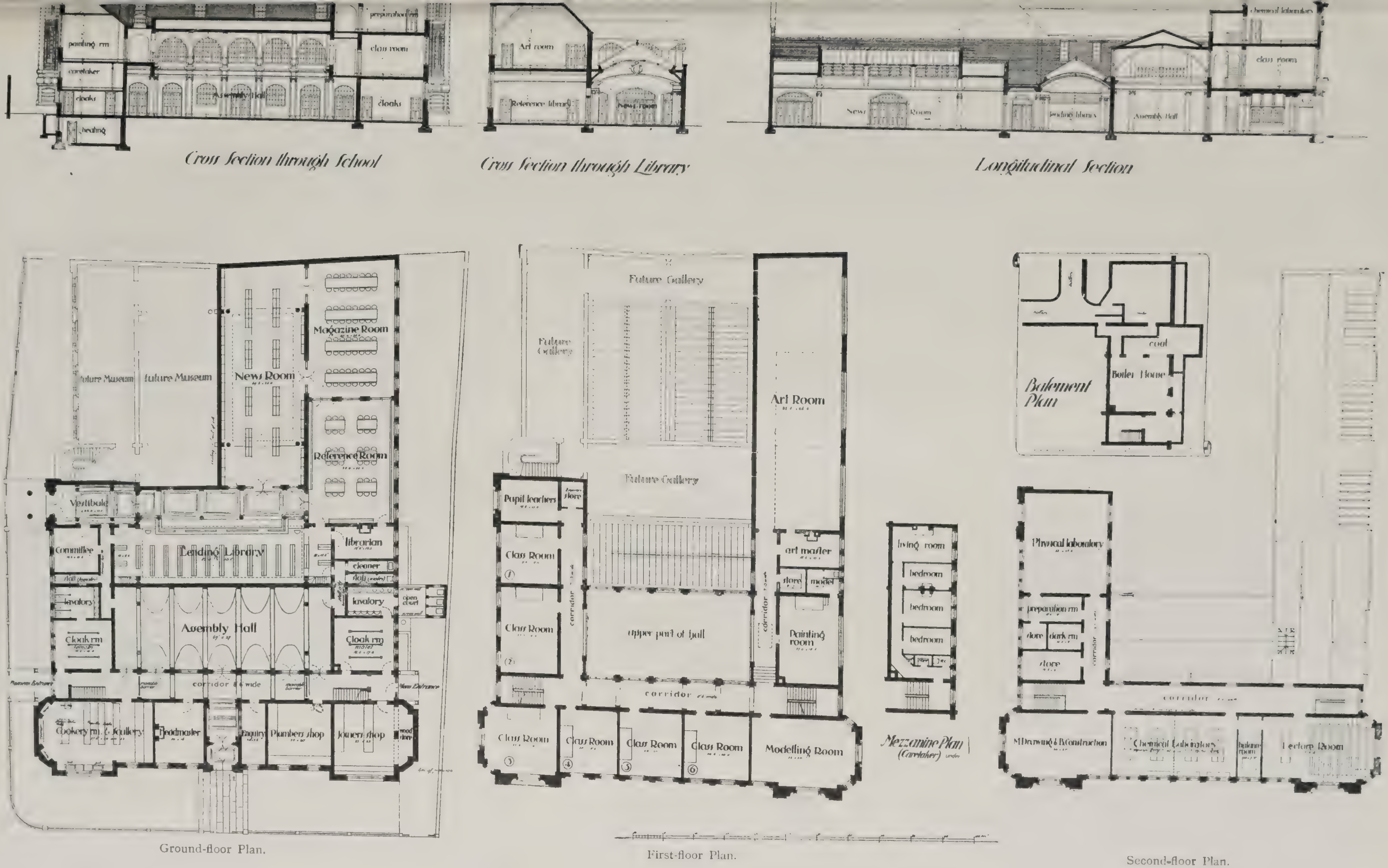
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, June 14th, 1905.





Cross Section through School

Cross Section through Library

Longitudinal Section

Ground-floor Plan.

First-floor Plan.

Second-floor Plan.

Accepted Design for Worthing Public Library, Technical School and School of Art. Henry A. Crouch, A.R.I.B.A., Architect.

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think you need have no fear in leaving, only you might have to establish in a court of law the fact that one of the conditions of agreement was that water should be laid on.

Mounting Drawings.

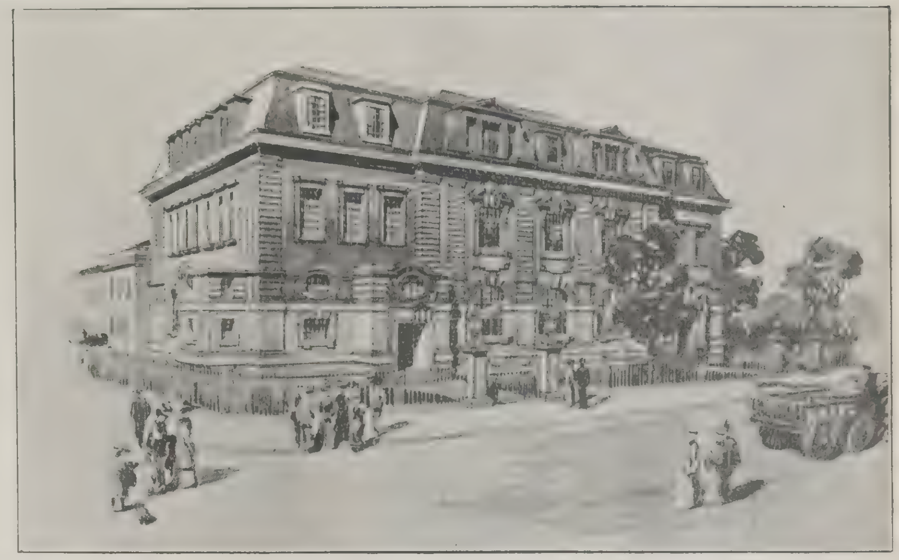
HOLMFIELD.—AMATEUR writes: "Please give a recipe for making a strong paste for mounting drawings which is not liable to go mouldy or be eaten by mice and other vermin."

Use rye flour, and prevent decomposition by the addition of 20 drops of oil of cloves to every half-pailful.

Roofing Tiles.

SURREY.—C. E. S. writes: "Are there any makers of the original old rich-red tiles for roofing?—I mean the sort that get covered with lichen in parts, whilst other portions always remain the delightful rich-red one sees on old buildings only. A well-known maker of roofing tiles told me recently that such tiles are very porous and do not keep out the weather, and if he made any for me he was sure I should not use them. Is this so? I have often used the hand-made sand-faced tile, but this soon goes a dark-brown colour and the red colour is quite lost."

The colour depends on the composition of a clay and the temperature of firing. Very light red is usually indicative of under-burning. The modern manufacturer is very keen on producing a non-porous tile, but it is doubtful if it is such a desideratum, for, if porous, vegetation soon grows on the surface, closes up the pores and throws the water off. To resist the weather, however, a tile must be vitrified throughout, and this requires a high temperature. In the past tiles were burnt with a wood fire and the difference may be due to this, wood giving a clean fierce flame that raises the temperature quickly, thus enabling the greatest temperature to be obtained (as it should be) at the end of the burning, so as not to deleteriously affect the surface while vitrifying the tile throughout. Probably the same result could be obtained by turning producer gas into the kiln or injecting powdered coal. Many modern tiles have only the outer skin vitrified (and almost glazed), while the inside is unburnt, and consequently frost destroys them. When tiles are machine-moulded from dry or semi-plastic clay they are often laminated, and then added facility is given for destruction by frost. To overcome both defects hard firing is indulged in, and this gives dark colours and a semi-glazed surface that are not very pleasing, and being so hard and non-absorbent do not allow the weather to colour them except with greasy dirt in smoky towns. There are few makers of old hand-moulded sanded tiles, especially wood fired, but the "Wrotham red" tiles made by Messrs. Thomas Pascall & Sons, of High Street, South Norwood, have a high reputation.



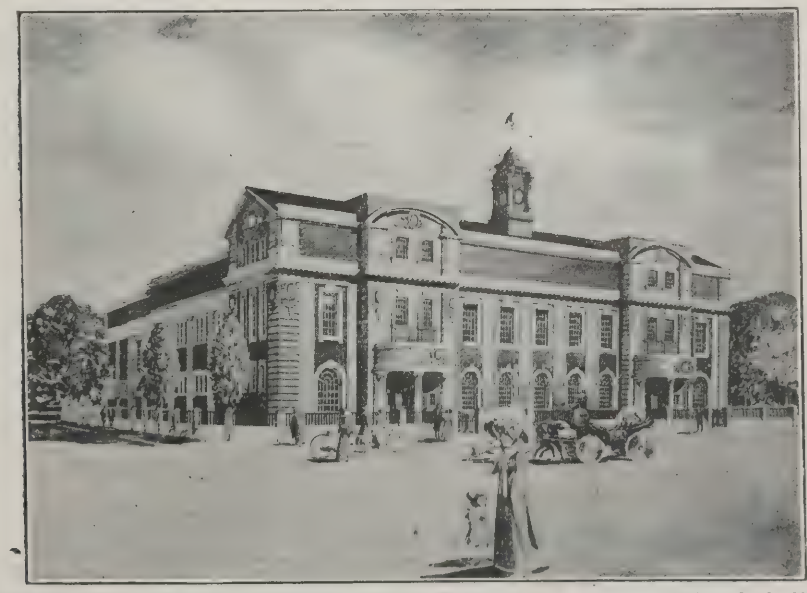
WORTHING FREE LIBRARY, TECHNICAL AND ART SCHOOL: SECOND-PREMIATED DESIGN BY LANCHESTER AND RICKARDS.

WORTHING LIBRARY COMPETITION.

ON a corner site at Worthing it is intended to erect a free library, technical and art school, with the addition of a museum later. A limited competition among fourteen selected architects was held and, as announced in our issue for May 31st, the design of Mr. H. A. Crouch, A.R.I.B.A., of London, was placed first by the assessor (Mr. John Belcher, A.R.A.); those of Messrs. Lanchester & Rickards, Russell & Cooper, and J. O. Gibson being placed second, third and fourth. These designs were submitted for the consideration of Mr. Carnegie, who is providing the funds. The first three premiums were £50, £25 and £15 respectively. It was one of the conditions that the library was to cost not less than £5,000 and the total cost not to exceed £15,000. As we publish Mr. Crouch's design in this issue there is no need to describe its arrangements in detail, which are best studied from the plans. It will be noticed that the library department is kept towards the back of the site and is very compactly arranged, while the technical school occupies the front on ground and first floors, the art school being disposed on the second floor. The central portion of the building consists of a good-sized assembly hall, well treated inside and extending up two storeys.

Messrs. Lanchester & Rickards' plan is almost square, with a central area, the technical school entrance being placed to the left on the main front and the library entrance to the right. The newsroom, 61ft. by 28ft. 6ins., extends along the main front, on the ground floor, with magazine room (45ft. by 17ft. 6ins.) to the right, book store (48ft. by 38ft.) in the centre, staff rooms behind, and reference room (34ft. by 26ft.) at the rear right-hand corner. The assembly hall is 59ft. by 34ft. On the first floor are the technical classrooms, with the art school above. The elevation is rather ill-proportioned and dumpy-looking.

The design by Messrs. Russell & Cooper has the library entrance to the left and the technical school entrance to the right. The assembly hall and the lending library and book store are both 70ft. by 30ft. The elevation of this design is very pleasing.



WORTHING FREE LIBRARY, TECHNICAL AND ART SCHOOL: THIRD-PREMIATED DESIGN BY S. B. RUSSELL AND T. EDWIN COOPER.

New Flats at Wimbledon.—At the corner of Belvedere Grove and Courthope Road, Wimbledon Hill, a block of high-class residential flats, called "Clifford House," is to be erected from designs by Messrs. Palgrave & Co. Messrs. R. Ward & Son, of Battersea, are the contractors.

Society of Architects' Visit to Liverpool.—Thirty-six members of the Society of Architects, from London and provincial centres, visited Liverpool on June 3rd. First the new Dock Board offices, of which Messrs. F. H. Hobbs and Arnold Thornely are the architects, were inspected, then a tour of the docks was made, after which Hatton Garden fire-station, St. George's Hall and the Town Hall were seen.

The Regent Hotel, Royal Leamington Spa, has been entirely remodelled, re-decorated and re-furnished under the direction of Mr. Ernest R. Barrow, A.R.I.B.A., of the firm of Brown & Barrow, 12, Norfolk Street, London. The builder was Mr. R. Cleaver, of Northampton; Mr. C. Ridley Shield acted as clerk of works; Messrs. Flavel, of Leamington, have fitted the kitchen and offices, and Messrs. Braithwaite, of Kendal, the laundry; while Messrs. Brown & Parsons, of Leamington, have executed the whole of the electric lighting, the Easton Lift Co. the passenger and service lifts, the Art Pavements and Decorations, Ltd., all faïence, wall-tiling and mosaic work, and Messrs. Shanks the sanitary fittings.

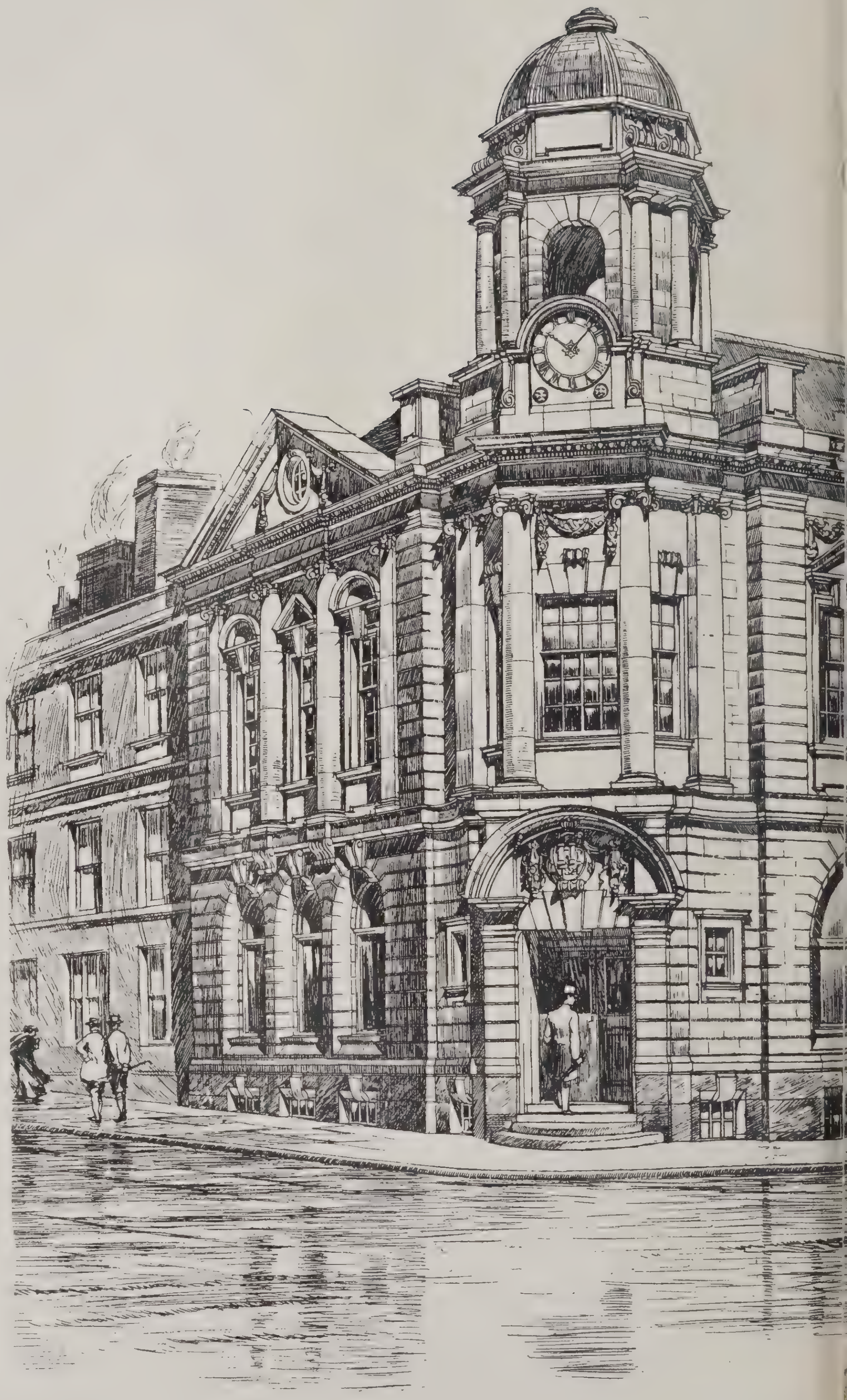
Builders' Notes.

South Wales Building Trade Employers' Federation.—At the annual meeting held last week in Swansea Mr. W. T. Morgan (Cardiff) was elected president and Mr. W. A. Linton (Newport) and Mr. W. O. Jenkins (Swansea) were elected vice-presidents.

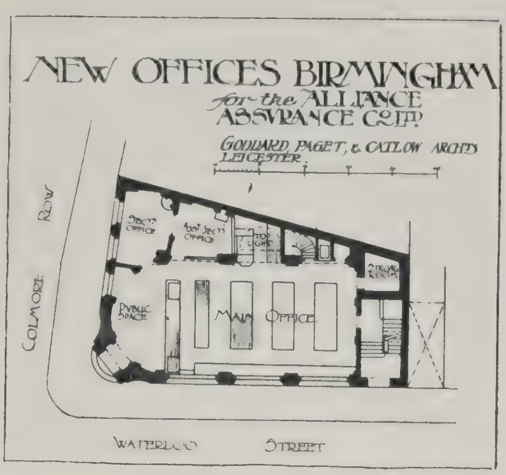
Newcastle Building Trade Dispute. — A conference between representatives of the Master-Builders' Association and the Bricklayers' Society was held last week at the office of Messrs. Oliver, Leeson & Wood, architects, Newcastle, in order, if possible, to arrive at a settlement of the dispute resulting from the demand for a reduction in wages and alteration of working rules. The proceedings lasted over three hours, without any arrangement being agreed upon.

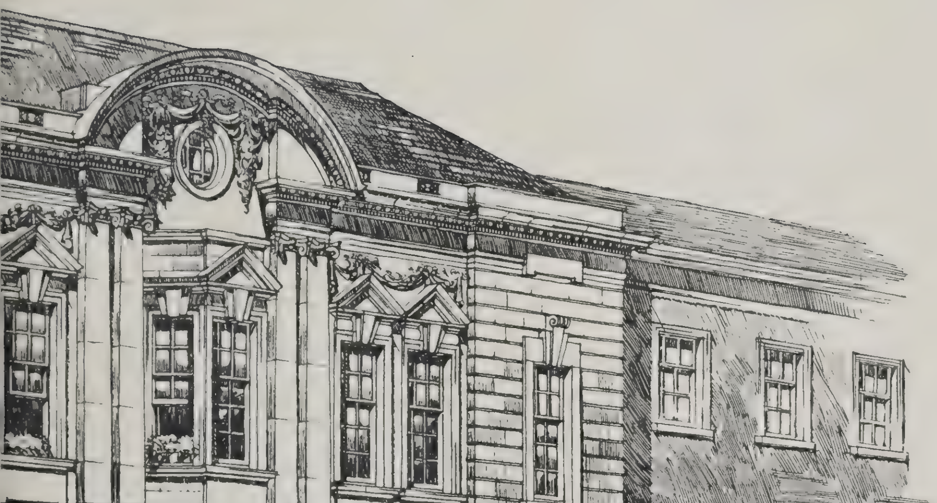
The Birmingham Builders' Exchange and Exhibition is to be opened on June 29th. The following are among the firms who are exhibiting:—Messrs. Mellowes & Co., Ltd., Sheffield; the Wood Carving Co., Ltd., Birmingham; Hambletts Blue Brick Co., Ltd., West Bromwich; Phillips & Sons, Birmingham; the Cannon Iron Co., Deepfields; the Perfector Window Co., Ltd., Nottingham; English Brothers, Ltd., Wisbech; the Haunchwood Brick & Tile Co., Ltd., Nuneaton; Yarrow & Co., Ltd., Bolton; Albert J. Shingleton, London; the Fire-Resisting Corporation, Ltd., London; Kenrick & Jeffereson, Ltd., West Bromwich; Kodak, Ltd., London; Maw & Co., Ltd., Jackfield; Kaye & Co., Ltd., Rugby; the Cloisonne Glass Co., Ltd., London; Samuel Platt, Ltd., Wednesbury; George Farmiloe, Ltd., London. A most complete system has been inaugurated whereby immediate reference may be made to the most important catalogues of the leading firms concerned in the erection and equipment of buildings, and a plan has been adopted to keep the library replete with all the newest publications. A most encouraging feature is the number of applications for membership of the Exchange, thus evincing a desire on the part of architects, builders and manufacturers to avail themselves of the facilities which such an institution offers for co-operation.

The Welsh Slate Industry. — A correspondent writes:—The following figures very eloquently illustrate the present crisis in the slate trade and point conclusively to the fact that free trade is ruining the slate and slab industry of Wales. France and America are the keenest competitors, and whilst they are sending slates and prepared chimneypieces into these islands free of duty, a heavy tax is placed on Welsh slates. The Britisher cannot get to his own market, owing to the competition in rates, and sell at the same price. Much less can he go to the Continent. In connection with this it should be remembered that in America, which is a protected country, workmen are paid better wages, yet they can, owing to free trade, beat us on our own market and by heavy taxes stop our goods going to their markets. At present the price quoted in North Wales quarries for 1,000 permanent blue slates 24ins. by 14ins. is £14 10s., and for slates 24ins. by 12ins. £13 12s. 6d. In addition, the purchaser would have to pay a rate of 10s. per ton to get the slates to Aberystwyth. In a letter to an Aberystwyth firm a French quarry company offer to deliver 1,000 slates of the same quality and size in Aberystwyth itself for £12 6s. and £11 respectively. The fact that these slates are probably sold as Welsh slates at Welsh prices accounts for the depression. In respect to chimney-pieces, America will deliver these goods in this country cheaper than they can be produced here, owing principally to the cheap freights.



These premises have been erected at the corner of Colmore Row and Waterloo Street, Birmingham. On the grou
In the basement are the surveyors' and typists' rooms, stationery store, strong-rooms and lavatory accommodation. The
Portland stone walls, and the roof covered with Westmorland slates. Internally the ground-floor offices are panelled in
the ceiling being of modelled plaster. The building is from the designs and under the superintendence of Messrs. Godda
stonecarving is by Mr. J. Crosland M'Clure, of Leicester, the modelled plasterwork by Mr. G. P. Bankart, and the marble





is the main office, with accommodation for about forty clerks, private offices being provided for the secretaries. oors are arranged for offices and caretaker. The materials used externally are grey polished granite for base, ny to a height of about 4ft., and above this the walls are lined with Brescia del Fomo and Pavonazzo marbles, ., FF.R.I.B.A., of Leicester. The general contractors were Messrs. John Bowen & Sons, of Birmingham. The decoration by Messrs. Fenning & Co., of London.

HOW PLASTER-OF-PARIS IS MADE.

THERE is a marked contrast in the methods of burning gypsum abroad. Most of the American rock is calcined in kettles by direct heat, and even where rotary cylindrical kilns are used the heat is direct. The French plaster manufacturers have invented a variety of kilns and methods which are held in high favour by the companies using them.

The Common Kiln.

One of the common types of kiln is a much simpler arrangement than the kettle, and would seem to represent a more crude method. A series of arches are constructed out of gypsum blocks and supported on piers of the same material. These arches are about 1ft. 8ins. wide and 2ft. 4ins. high. On these are placed large blocks of gypsum, then smaller and smaller blocks until the kiln is filled to a height of about 13ft. The whole kiln is covered by a shed roof, and spaces are left between the blocks to give a draught. The arches are filled with wood, and a hot fire maintained until the lower blocks begin to grow red-hot, which requires about ten hours. Then a slow fire is kept for ten or twelve hours. The lower rock over the arches is overburned and the upper rock underburned, but a mixture of the whole gives a fairly uniform plaster. Such a kiln holds 70 tons to 75 tons of rock, and the plaster is removed in from two to three days. It requires 1,200 faggots of wood, which now cost 1s. 8d. a hundred. Many kilns use part coal in the form of briquettes.

The Brisson Kiln.

The kiln just described is used more commonly than any other, but a number of plasterworks are now using improved kilns where the heat is usually indirect. The Brisson kiln used at Pantin is analogous to a gas furnace in construction. It has eight retorts, each holding six hectoliters of gypsum, heated by a single fire, attended by a single workman and yielding a very white plaster. The plaster made in the rough kilns previously described is usually grey. For a long time any process making white plaster was looked upon with suspicion in France, as the grey plaster was considered superior in quality.

The Dumesnil Kiln.

Another variety of kiln held in high favour in France is the Dumesnil kiln. This has a central fire-pit with a fire chamber above, which is connected with radiating flues constructed of the larger fragments of the gypsum rock. Above these flues the stone is arranged in layers, containing smaller and still smaller fragments towards the top. In the arch forming the top of the kiln are flues controlled by dampers. The gypsum is charged through an opening in the rock and removed through a door at the side. The kiln is 20ft. in diameter and 13ft. in height to the top of the arch. It will hold 1,200 cub. ft., and is burned in twelve hours with a fire of faggots and in a little less time with coal. The method is said to be economical and the plaster uniform in quality.

German Methods.

In the Hartz Mountain district of Germany the gypsum is ground on mill-stones. The plaster is calcined in iron kettles set in masonry and the material is kept in motion by revolving stirrers. At Osterode one mill uses a round iron-vessel as a muffle kiln for burning the plaster.

In Ellrich and Walkenried some double shaft ovens 13ft. high and 5ft. in diameter are used. The fuel and gypsum are placed in these shafts in alternate layers and covered with a shed roof. As soon as the plaster is completely calcined it is drawn out from below and more material added to the top.

In some of the primitive mills the rock is broken in stamp mills. The stamps are made of maple or oak, with an iron shoe at the bottom giving a length of over 9ft. These fall in a trough of wood with an iron-grate bottom. It is ground finer in a roller machine in which heavy rollers move over a pan somewhat like a mortar-mill. In some mills a jaw-crusher is used, and the fine grinding is there accomplished by means of mill-stones.

AMERICAN CONCRETE FLOOR PRACTICE.

THE following notes on some of the more general methods of constructing concrete paving and flooring *in situ* will be of interest, and are suggestive in regard to specification clauses, which as usually written by architects are very loosely drawn:—

Excavation.

The depth of the excavation depends largely on the soil. For outside work excavate to the depth of 16ins. to 24ins.; if paving is bounded by soil on each side excavations should extend at least 1ft. on each side of the wall. Thoroughly ram the soil and fill the excavation with clean cinders, clinker, slag, gravel and broken stone. Dampen this and ram it well into place. The excavation should be filled to the height where the concrete is to be deposited. Keep well and thoroughly compacted.

The Concrete.

The thickness of the concrete should be 3ins. to 6ins, according to the strength required and the size of the slab. Proportions: One barrel of good Portland cement, two and a half barrels of clean, sharp, coarse sand, free from loam or clay, and five barrels of clean coarse gravel or broken stone not exceeding $1\frac{1}{2}$ins. in size, screened (as is usual) of sizes below $\frac{1}{4}$in., and free from dust. If the gravel or broken stone contain much of the size of sand the proportion of added sand should be correspondingly decreased. The cement and sand must be thoroughly and uniformly mixed in the dry state, then the water added and the mortar turned until the water is thoroughly incorporated; the broken stone or gravel, previously wetted, is then added and turned thoroughly several times. Uniformity of concrete mixing is very necessary. Deposit immediately before set, and tamp well before water rises to surface.

The Top Coat.

Thickness 1in. to $1\frac{1}{2}$ins., according to strength required. Proportions: 1 part of good Portland cement and 2 parts of clean, coarse, sharp sand or coarsely-ground trap rock, ground limestone or sand free from dust, any size up to $\frac{1}{16}$in. or $\frac{1}{8}$in., and never exceeding $\frac{1}{4}$in. Mix dry until uniform, and then add the proper quantity of water. The top coat must always be laid before the concrete has begun to set, and the water used must be clean, free from mud, sewage, alkalies and acids. Cold water retards setting and warm water accelerates it.

The Dryer.

It is often found advisable to take equal parts of the cement and fine sand obtained by screening sand, or equivalent, which is used in the top coat, and to spread it uniformly over the surface, in all cases being careful to get it well trowelled in before setting has begun in the top coat.

Slabs.

Pavements or floors should never be laid in continuous sheets or cut into slabs. Where the slabs are 4ft. by 4ft. or 5ft. by 5ft. a total thickness of 4ins. or 5ins. is required, and if slabs 6ft. by 6ft. the thickness should be from 5ins. to 6ins., and for several purposes, such as floors which must bear heavy traffic, the thickness should be increased to 7ins. or 8ins., according to good judgment of the requirements.

Joints.

The concrete should be cut entirely through, and the top coat should be cut nearly through, forming a **V**-shape groove with round edges on a bevel, and the blocks should be laid off in alternate rows. Tarred paper or clay paste can be used between joints to prevent adhesion. Between the lap joints also use clay paste, as this makes the joints more impervious. Expansion joints, to take up expansion due to changes of temperature, should be laid wherever necessary. For instance, in long walks expansion joints of white pine $\frac{1}{4}$in. in width should be laid for 20ft. or 40ft. The expansion of cement-concrete under changes of temperature is approximately the same as that in steel rails.

Colouring Matter.

Where colours are employed other than the natural sand and whitish-yellow cement, it must be borne in mind that colouring matters containing grease or acids are to be avoided, as, for instance, lampblack, graphite and the like, which are very injurious to the cement. Care should be taken in the selection of the colouring material, which should be secured from a reliable maker, stating the purpose for which it is to be used.

The Setting.

The finished surface should be protected from dirt, too rapid evaporation, hot air, the rays of the sun, currents of air, showers and frost, and from any mechanical injury during the process of hardening. If the evaporation should be too rapid, the cement will be deprived of water necessary for setting and hardening. All this work should be done by competent workmen, experienced in the laying of cement pavements, in every case where it is possible to obtain skilled labour.

Concrete Proportions.

Below are proportions for the making of concrete, which come from an authoritative source, and are the exact proportions for some of the most extensive and successful operations that have been executed in the United States recently.

To mix the strongest concrete for the construction of steps, arches or the like, it is necessary to use 1 part of Portland cement, 2 parts of sand and 4 parts of broken stone.

To make a very strong concrete suitable for foundations of pavements, engine foundations or piers, 1 part of Portland cement, $2\frac{1}{2}$ parts sand and 5 parts broken stone.

Strong concrete suitable for construction of the tallest skyscraper should have 1 part of Portland cement, 3 parts of sand and 6 parts of broken stone.

For concrete suitable for almost all ordinary purposes, 1 part of Portland cement, 4 parts of sand and 8 parts of broken stone.

ST. MARGARET'S, WESTMINSTER.

Restoration of the East Window.

THE great east window of St. Margaret's Church, Westminster, is proposed to be restored. It is said to have been designed for Henry VII.'s Chapel, and refused admission by Henry VIII.; then, having passed from one owner to another, the munificence of Parliament caused it to find its abiding home at St. Margaret's in 1758, after more than 250 years of wandering.

It is stated that the window needs to be taken out and releaded, and that, unless the work is undertaken without delay, the glass will suffer. At present the window is awkwardly placed inside the frame of a much larger window removed to make room for it in 1758. At the time there was erected a sham Gothic apse which concealed this circumstance, but, now that the sham apse has been very properly swept away, it is manifest to everybody that the window ought to be placed higher in the wall. Moreover, the existing wall is in a bad state. It is, however, destitute of historic interest, for the east end of the church has been frequently rebuilt since the Reformation.

In view of these facts it has been decided to undertake the renovation of the east end of St. Margaret's. With this object a representative committee has been formed, and it has been decided to entrust the work to Mr. C. E. Kempe. The Restoration Committee will acquire from His Majesty's Office of Woods possession of the narrow strip of ground which separates the wall of the church from the railings, and the new east wall will be built a little eastwards of the present wall, giving a slightly greater length to the chancel and breaking the squalid flatness of the Georgian exterior.

The cost of the whole work is estimated at £3,000.

Obituary.

Mr. W. J. Taylor, architect and surveyor, of Sheffield, died recently from blood-poisoning, caused by an accident while visiting some property at Dore. He was in his forty-seventh year.

A new Convalescent Home has been built at Bexhill from designs by Messrs. Rowland Plumbe & Harvey. It is Georgian in style, carried out in purple bricks, with red dressings, and red tiles on the roof. Accommodation is provided for 71 patients, but when two more wings have been added there will be accommodation for 118.

Correspondence.

Stalls.

To the Editor of The Builders' Journal.

Sir,—In reply to Mr. Harry Hems I would submit the following facts:—At Conway and Llanrwst, where the old rood screens remain intact, the choir and musicians used to be accommodated in the rood loft till about fifty years ago. This was undoubtedly the mediæval arrangement. Where rood lofts were demolished the materials and parapet fronts were often used to form western galleries for the singers, who had been deprived of the rood loft. Where the church was too low for a gallery a slightly raised platform was made at the west end. The chancel in my design is very small, 16ft. by 12ft., and could not contain a choir, and the church is too low for a rood loft or western gallery, so I did the most traditional thing that could be done and placed them on a step at the west end, which is a good position practically also.

The best authorities seem to agree that surplice choirs as we term them never existed in our parish churches in mediæval times. Mixed choirs in chancels are an exhibition of Sunday hats not to be tolerated at any period till recently. The last thing I should wish to do would be to introduce any foreign traditions.—Yours truly,

Conway. HERBERT L. NORTH.

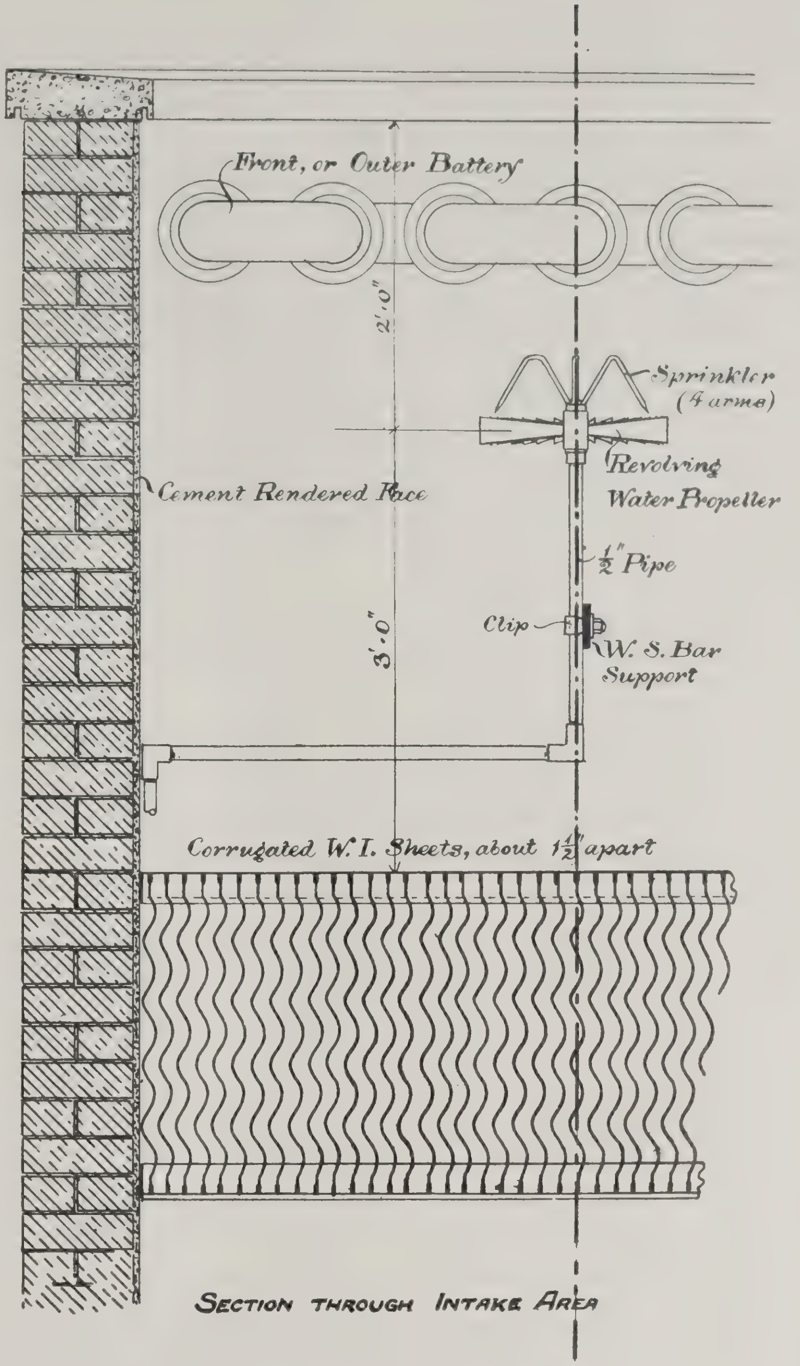
Views and Reviews.

The Plenum System of Ventilation.

This is a very practical and useful book on the plenum system. There are no lengthy definitions of what ventilation really is, nor elaborate analyses of air, its constituents, &c., as usual to the introduction of this much-debated subject. The author has quite another object in view, namely, to give the architect sufficient information to enable him, if not to design a propulsion system, at least to intelligently criticize a scheme and to superintend the structural part of the work. In an introductory chapter Mr. Griffiths comes down on the advocates of "natural" ventilation. As he observes, the quantity of air admitted under this system is only partially under control—that is to say, the entrance of fresh air can be regulated by the opening or closing of windows, or by other means; "but, as the entrance of fresh air is due to the amount of wind-pressure, and its direction, this cannot be regulated. In other words, if the wind be directed against the openings, and, should its velocity be such as to supply more air than is required, windows, &c., can be closed or partially closed, and the ventilation regulated to the required degree; but, should the velocity of the wind be too low, or in such a direction as not to be against the openings, then it is clear that no opening of the windows will induce the air to enter the apartment required to be ventilated, and ventilation, as such, ceases."

By the plenum or propulsion system the amount of air admitted can be controlled absolutely, and, moreover, it can be warmed, cooled and washed as desired.

For driving the fans, steam, gas and electric power are used, but the last-named is by far the best. The qualities of each are discussed in the third chapter of this book. As to the fans themselves, the author rightly draws attention to the fact that many are faultily designed, causing a churning rather than a propulsion of the air. From 250 to 280 revolutions per minute should be the maximum velocity, except when silence is not a necessity, as in the case of drying-rooms. At higher speeds there is a perceptible buzz.



THE MIST SCREEN FOR PURIFYING AIR.

A most interesting chapter is that on air purifiers and humidifiers. There are six kinds of screens generally employed for cleaning the incoming air. These are—the canvas screen, the coke screen, the fixed fibre screen, the revolving fibre screen, the cylindrical revolving screen and the mist screen. The author considers that the canvas screen is neither very durable nor efficacious; the coke screen unsatisfactory because it is likely to be packed either too tightly or too loosely; the fixed fibre screen also unsatisfactory because it accumulates soot, &c., when water is not running over it; the revolving fibre screen considerably better, though, being of double thickness, it puts more work on the engine and, by continually revolving, it tears; and the cylindrical revolving screen the most cleanly of the fibre screens; but the best of all is the mist screen, of which we give a diagram on this page. This consists of a copper sprinkler fixed within about 2ft. of the top of the brick-built intake shaft, and having below it a revolving propeller which throws off the water in the form of a very fine mist, through which the air has to be drawn. About 3ft. below the sprinkler are galvanized corrugated iron sheets, spaced about 1½ins. apart, between which the mist falls, so that the air is doubly purified. Below is a shallow tray connected to the drain, into which all water and impurities are conducted.

In the chapter on ducts and flues the author points out that these should be formed of brick, with floors laid to falls to gulleys, and rendered throughout in Portland cement, finished with a trowelled face. He does not favour double ducts. As to heating batteries, the best method is to fix these immediately against the bottom of the vertical flues and to heat them with steam. All details are discussed by the author, and in succeeding chapters he deals with dust, changes of air, tests and comparative cost. In reference to the last, a detailed bill is given of the costs of maintenance (1) with hot-water apparatus, (2) open fireplaces and (3) plenum system, by which it is shown "that the luxury of a propulsion installation for a building containing about 250,000 cub. ft. will entail a total annual cost of about £229 per annum in excess of hot-water apparatus, and about £166 per annum in excess of open fires; but it must not be forgotten that for this additional annual outlay something like

5,572,800,000 cub. ft., or about 186,589 tons, of filtered, humidified and warmed air would be thrown in as a *quid pro quo.*"

The book is thoroughly practical, being full of useful information, and as such should be of much service to architects.

"The Plenum or Propulsion System of Heating and Ventilation," by Harold Griffiths, A.R.I.B.A., F.R.San.I., A.M.I.C.E. London: Simpkin, Marshall, 4, Stationers' Hall Court, E.C., price 4s. 6d. nett, post free.

Law of Sewers and Drains.

Mr. MacMorran, K.C., has long been known as an authority on the law of sewers and drains, and the work written by him, in conjunction with Mr. W. Addington Willis, constitutes a much needed and authoritative text-book on a difficult and complicated subject. That such a prodigious work of 580 pages, with an index extending to another 125 pages, should be necessary to explain the legal points involved in such an everyday question is something of a disgrace to our legislative system. Doubtless, however well a measure is draughted, some ingenious people will be able to evade or to pick holes in its provisions, and it has often seemed to us that there should be a standing legal committee in Parliament who should, at the request of one or both Houses, consider the various decisions given in litigation under any Act that has been in force for a certain period, and re-draught any clauses or interpolate fresh clauses which would enable mistakes to be rectified and new points to be met, and would ensure the enforcement of the laws in the spirit in which they were conceived or required. Such a committee would provide for the gradual and continual rectification of laws which had proved defective in working. Needless to say, the Public Health Act, 1875, and allied Acts are most urgently in need of overhauling. As the authors observe in their preface, "It would be mere presumption to suggest that any work, however carefully prepared, could make the subject simple; and all that the authors of this book can or wish to claim is its completeness as a digest of this branch of law."

"The Law relating to Sewers and Drains," by Alexander MacMorran, M.A., K.C., and W. Addington Willis, LL.B., price 25s. nett. London: Butterworth & Co, 12, Bell Yard, Temple Bar, E.C; Shaw and Sons, 7 and 8, Fetter Lane, E.C.

Sanitary Law and Practice.

This is a handbook for students, dealing with the work of the medical officer of health and sanitary inspector, and the various matters are dealt with from that point of view. The matters are multifarious, and it is not surprising that the book extends to 760 pages. The book is most valuable and complete, and the inclusion of a summary in each section of the laws affecting that branch of the work is not the least useful part of the book.

"Sanitary Law and Practice: A Handbook for Students," by W. Robertson, M.D. (Glas.), D.P.H., and C. Porter, M.D., B.Sc. (Public Health), M.R.C.P. Edin., price 10s. 6d. nett. London: Sanitary Publishing Co., Ltd., 5, Fetter Lane, E.C.

Municipal Matters.

The various branches of municipal engineering are now becoming so complex that some kind of summary or introductory treatise to them is needed for the benefit of the councillor and student, and of recent years a number of cheap handbooks have appeared which seem to have been designed with this end in view. Of this class of text-book may be mentioned two little works just issued from "The Local Government Journal" office, 27A, Farringdon Street, E.C. The first—"Electric Traction on Street Tramways," by C. Biggs, A.I.E.E., price 6d.—sets forth the merits of the overhead, conduit, contact and other systems of tramway traction, with notes on the machinery required, &c. In twenty-six pages it need hardly be said that the subject is no more than outlined; but the information is clearly and concisely written, and should find a ready sale among those who want to grasp a difficult and complicated subject. The second work—"The Water Supply of Villages and Small Towns," by H. C. H. Shenton, M.S.E., price 6d.—a more ambitious work, extending to some fifty odd pages, gives very succinctly in paragraph form the various sources of supply, the measuring and gauging of supplies, with notes on wells and well-boring, rams, wind-power pumps, water-wheels, pumps of various classes, reservoirs, as well as short notes on the construction of dams, reservoirs and the laying of the mains. From these notes a very good idea of the work involved in water-supply can be obtained, and they form a fitting prelude to further study.

From the same office comes an expert criticism of the Valuation Bill, 1904, price 6d., which deprecates the value of this measure either for securing uniformity of taxation or better facilities for proper assessment.

Competitions.

New Technical Institute, Rochester.—One hundred and thirty-one designs have been submitted in this competition.

Competition for Free Library, Hove.—The Competition Reform Society disapprove of the conditions of this competition because there is no professional assessor, and no undertaking is given that the successful competitor will be employed. Architects are requested to abstain from competing unless the conditions are satisfactorily revised.

Primitive Methodist Orphanage, Harrogate.—Thirty-six designs were submitted for this institution, comprising ten pairs of homes, with master's house and entrance lodge. The first premium (£25) has been awarded to Messrs. Oldham & Hill, of Manchester, and the second (£15) to Messrs. Boyd & Groves, of Newcastle-on-Tyne. Mr. F. W. Dixon was the assessor.

Hammersmith Baths and Washhouses.—The design by Mr. J. E. Franck, A.R.I.B.A., of London, has been selected in a limited competition of six, subject to its being found possible to carry out the work for the stipulated sum of £45,000. The other competitors were Messrs. A. W. S. Cross, J. M. Ross, Maurice B. Adams, Spalding & Spalding, and E. Harding Payne.

Southend Schools Competition. — Fifteen sets of plans (by thirteen architects) have been sent in for the competition for new schools in Bournemouth Park Road, Southend-on-Sea. The committee have awarded the first place to Messrs. Greenhalgh & Brockbank, of Southend; the second to Mr. G. E. Clare (of Messrs. Clare & Ross), of Southend and London; and the third to Mr. D. H. Smith, of Southend.

Wesleyan Church House, Westminster.—The trustees of the new Wesleyan Church House at Westminster, having selected nine designs from the 132 originally submitted by architects, have, acting upon the advice of Sir Aston Webb, their professional assessor, finally accepted the design of Messrs. Lanchester & Rickards, of London, W.C. It is thought that the cost of the building (which has a large dome and will be loftier than either the Westminster Hospital or the Westminster Palace Hotel) will amount to £140,000. The style of architecture chosen is the Renaissance. In working out the design its proportions and massing have been allowed to develop from the necessities of the case, the form of the large hall being naturally the dominating influence, while the expressed desire for a building of monumental character has been an important factor in determining the treatment of the detail. Applied ornament and sculpture have been sparingly used and figure-work has been almost wholly avoided, as unsuited to the purposes of the building. In the basement there will be a tea room to seat 550, and another to seat 450. The mezzanine at ground level will comprise thirteen offices, two strong-rooms and a lavatory. The ground floor will comprise a conference hall to seat 300, reading-room, library, small hall, four committee rooms, librarian's room, vestry and two lavatories. The mezzanine above the ground floor will contain twelve offices and two lavatories. On the first floor will be the assembly hall, seating 1,401 on the floor, cloak-rooms and lavatories, two vestries, a reception-room and eleven offices; on the second floor, galleries accommodating 1,155, making a total seating accommodation for the assembly hall of over 2,500. The librarian's house will be on the third and fourth floors.

Keystones.

A new Wing to St. Edmund's College, Ware, has been erected from designs by Mr. F. A. Walters, F.S.A.

New Station at Peebles.—A commencement has been made with the new station on the North British Railway at Peebles. The cost will be nearly £5,000.

Red House, Chapel Allerton.—Messrs. J. Hodson & Son, Ltd., of Nottingham, request us to state that the Hopton Wood stone for this house, illustrated in our issue for last week, was supplied by them.

Change of Address.—Messrs. Leaning & Tanner, quantity surveyors, have moved from 28, John Street, Bedford Row, W.C., to No. 7, Southampton Street, Bloomsbury Square, W.C.

London Squares. — The Parliamentary Committee of the London County Council is to prepare a Bill for introduction into Parliament in the session of 1906 with a view to securing that the garden squares and enclosures in London should remain unbuilt upon.

A Nurses' Home and Laundry at the North-Eastern Hospital are proposed to be built. This is part of a scheme of enlargement including an isolation block, new out-patients' department, post-mortem room and probably a milk dispensary, estimated to cost £30,000.

L.C.C. New Dwellings. — The London County Council have approved the expenditure of £51,500 for the erection of five blocks of dwellings on the Webber Row area, Southwark. Tenders amounting to £13,919 have also been accepted for the erection of twenty-eight first-class, eight second-class and twenty-four third-class cottages on the Tottenham estate.

"Parliament Chambers," a block of offices and business premises facing Church House, Great Smith Street, Westminster, is now being completed from designs by Messrs. Palgrave & Co. The entrance halls are panelled with Irish green and black Devonshire marbles, and the steps are of white Sicilian marble. Messrs. L. Whitehead & Co. are the builders, and Mr. Farrell is the clerk of works.

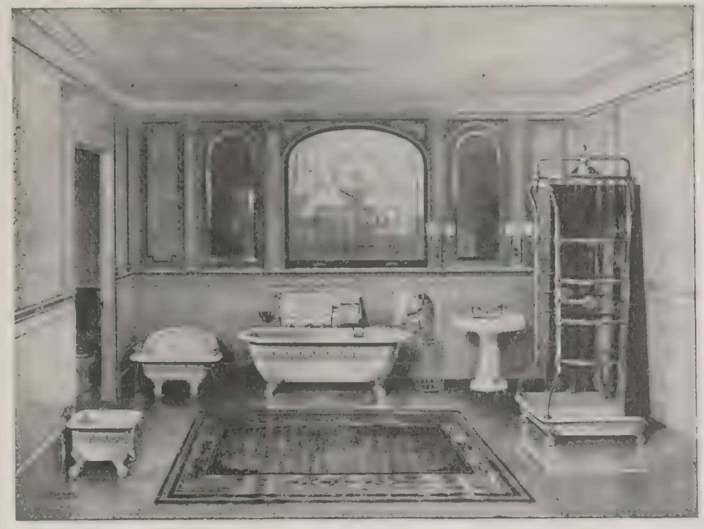
The Admiralty Buildings.—In reply to a question, Lord Balcarres stated in the House of Commons last week that the first contract for these works was commenced in December, 1889. The contract for the third extension building now in progress is to be completed on May 1st, 1906. The expenditure on the buildings (including architects' commission) has been £413,647. There have been several successive contracts; that now running, for the superstructure of Block III. and alteration of the old Admiralty, is held by Messrs. Holloway Brothers. The penalty for delay is £100 per week.

Asylum Extension.—A wing to accommodate forty-five patients is to be added to the combination asylum at Hoddington.

The Exhibition of Works in Wood and Woodcarving will be opened by Lord Avebury at the Carpenters' Hall on Monday next, June 19th, at 3 p.m.

A Reproduction of the Hall of Darius at Persepolis, one-eighth the size of the original, has been carried out for Mr. J. Bland Sutton at his house in Brook Street, W. The room is 40ft. square.

Messrs. R. Waygood & Co., Ltd., have declared a dividend of 9 per cent. for the year on their ordinary shares, carrying forward £3,389. Including £6,074 brought forward from last year, the company made a profit of £29,339 during the year ending March 31st last.



A MODERN BATHROOM BY THE STANDARD SANITARY MANUFACTURING COMPANY.

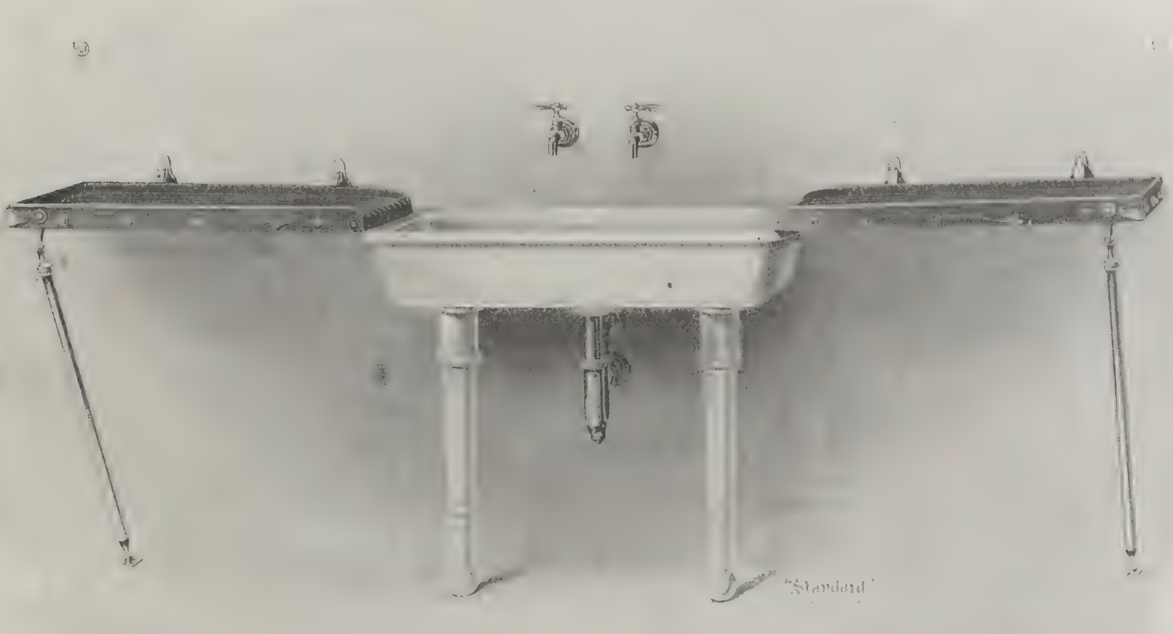
MODERN SANITARY FITTINGS.

THE Standard Sanitary Manufacturing Co., of 22, Holborn Viaduct, have brought out a large catalogue of their sanitary appliances. This is distinctly superior to any other catalogue of its class we have yet seen. It is printed on thick art paper and illustrated with a large number of photographs, coloured plates and drawings. Two illustrations from the catalogue are given on this page. These show how excellently they illustrate all the details. The catalogue comprises 484 pages, and is well bound. The Standard Sanitary Manufacturing Co. is the largest firm in the United States manufacturing this class of goods, and they have five factories at Allegheny, Louisville, New Brighton and Detroit. During the short time they have been established in London they have built up a large and rapidly-growing trade throughout the country.

A distinguishing feature of American sanitary work is the finish of the goods and the neatness of every detail, to which most careful attention is paid. "Standard" sanitary ware is of the very best type. It is not manufactured in porcelain, as might be supposed from its appearance, but is of cast-iron coated with a special porcelain enamel. The ratio of expansion, elasticity and contraction of both the enamel and the iron is the same, thus preventing the slightest tendency to craze or crack, a common fault with ordinary enamelled iron, and very often with earthenware also. It is claimed that the "Standard" porcelain enamelled iron is superior to both, and every piece is guaranteed, which cannot be said for most goods of this kind on the market. It is remarkable for a very fine finish; on the largest surfaces there is hardly any unevenness. The enamel is quite hard, smooth and non-absorbent, and does not retain grease or dirt. Its excellence can be judged from the list of uses to which it has been put, which are various enough to try it to the utmost. The firm manufacture the following:—Baths of all kinds, lavatory basins, water-closets, kitchen sinks and slop sinks, urinals, &c.—all in enamel ware. A large number of designs in each class of goods, together with all sorts of "Standard" fittings, such as bath cocks, wastes, towel shelves and rails, clothes hooks, cisterns, &c., are illustrated in the catalogue.

The bathroom is a very important compartment in a house, but it is comparatively only recently that it has received proper treatment. The accompanying illustration shows the fitments of a bathroom suggested by the Standard Sanitary Manufacturing Co. This will be seen to comprise an ordinary long bath, a sitz bath and a foot-bath, all standing away from the wall and above the floor, a pedestal lavatory basin, and shower and needle baths. Shower baths, though not very generally used, are becoming more popular, as this form of bathing is without doubt one of the most pleasant and exhilarating: hence modern hotels and apartments are being equipped with showers, and specifications for the better-class residences now generally include them. The illustration above also shows other little fittings, such as towel racks, towel baskets, &c. Kitchen sanitation is of equal importance, and in this connection we draw attention to the accompanying illustration of a "Standard" porcelain enamel sink with draining-boards having hinges which allow them to be folded against the wall.

In this catalogue one point architects should specially note is that the sizes of all goods are carefully given, as it is very useful in planning to be able to know the space required and whether a corner can be utilized advantageously. We may mention that this firm supplied all the baths to the new Midland Hotel at Manchester. For the benefit of architects and their clients two model bathrooms have been fitted up at the firm's showrooms, 22, Holborn Viaduct, E.C.



KITCHEN SINK, WITH FOLDING DRAINING-BOARDS BY THE STANDARD SANITARY MANUFACTURING COMPANY.

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
June 15	Barbon, near Kendal—Alterations to School	——	J. F. Curwen, 26 Highgate, Kendal.
,, 15	Barnsley—Premises	——	Senior & Clegg, 15 Regent Street, Barnsley.
,, 15	Cuminestown, N.B.—Additions to School	——	Duncan & Sons, Architects, Turriff.
,, 15	Oughtibridge, near Sheffield—Cemetery Chapel	Parish Council	Ellis Brothers, 37 Orchid Street, Sheffield.
,, 15	Stoke-on-Trent—Church Extension	——	Lynam, Beckett & Lynam, Stoke-on-Trent.
,, 15	Hastings—Repairs to Two Cottage Homes	Guardians	Union Offices, 11 Wellington Square, Hastings.
,, 15	Wakefield—Parochial Hall Buildings	——	Mr. Simpson, Southgate Chambers, Wakefield.
,, 15	Newcastle-on-Tyne—Thirteen Houses and Three Shops	Mr. S. Kirk	10 Trafalgar Street, Newcastle-on-Tyne.
,, 16	Llangoed—Pair of Stone-built Cottages	H. A. Christy	James Cheyne, The Ley, Llyswen.
,, 16	Nottingham—Entrance Lodge	Public Parks Committee	F. B. Lewis, Guildhall, Nottingham.
,, 16	Wetherby—Infirmary	Guardians	Workhouse, Wetherby.
,, 16	Sheffield—Enclosing Land	Trustees of Loxley Chapel	G. A. Wilde, 9 Bank Street, Sheffield.
,, 16	St. Bride's-super-Ely—Alterations to Chapel	——	Mr. John, Tyfri, St. George's.
,, 16	Nottingham—Lodge	Public Parks Committee	F. B. Lewis, Guildhall, Nottingham.
,, 16	Nigg, N.B.—Hall	——	Brown & Watt, Architects, Aberdeen.
,, 16	Brithdir, Wales—Alterations to Inn	——	G. Kenshole, Station Road, Bargoed.
,, 17	Rye—Two Receiving Wards	Guardians	E. J. Cory, High Street, Rye.
,, 17	Alburgh, Norfolk—Repairing Farm Premises	——	James Gooderham, The Heywood, Diss.
,, 17	Pershore, Worcs—Walls	Joint Burial Committee	L. E. Clayton, Bridge Street, Pershore.
,, 17	Fermoy—House and Stables	Dr. Woodroofe	C. H. Ashworth, 42 Dame Street, Dublin.
,, 17	Neen Sollars—Teacher's House	Managers	F. J. Moore, Neen Sollars.
,, 19	Dartford—Carsheds	Urban District Council	T. E. Tiffin, Council Offices, Dartford.
,, 19	Cromer—Stoneyard Building	Urban District Council	A. F. Scott, West Street, Cromer.
,, 19	Batley—Additions to School	Governors	W. Hanstock & Sons, Branch Road, Batley.
,, 19	Bradford—Laboratory Fittings	Education Committee	Hope & Son, 23 Bank Street, Bradford.
,, 19	Buckley, near Chester—Alterations to School	——	Vicarage, Bistre, Buckley, Chester.
,, 19	Canterbury—Renewing Slating of Roof, &c.	Guardians	H. Doré, 8 High Street, Canterbury.
,, 19	Halifax—Lodge	——	W. C. Williams, 29 Southgate, Halifax.
,, 19	Mountain Ash, Wales—Chapel	Trustees	Morgan & Elford, 1 Jeffrey Street, Mountain Ash.
,, 19	Truro—Repairs to School	Education Committee	B. C. Andrew, Biddick Court, St. Austell.
,, 19	Salterhebble, Halifax—Schools	Corporation	James Lord, Town Hall, Halifax.
,, 20	Selly Oak, Birmingham—Alteration at Workhouse	Guardians	C. W. Whitewell & Son, 23 Temple Row, Birmingham.
,, 20	Grayingham—Alterations to Church	——	Rectory, Grayingham.
,, 20	Hove—School	Education Committee	Clayton & Black, 10 Prince Albert Street, Brighton.
,, 21	Ashton-under-Lyne—Mortuary, &c.	——	Infirmary, Ashton-under-Lyne.
,, 22	Ramsbottom—Improvement to School	——	Rev. J. J. Lewis, Vicarage, Ramsbottom.
,, 22	Lightcliffe, Yorks—Bungalow	——	R. Berry, Commercial Street, Halifax.
,, 22	Hadfield—Bakery	Co-operative Society, Ltd.	Office, Wesley Street, Hadfield.
,, 22	Bristol—Laundry	Education Committee	P. Addie, Council House, Bristol.
,, 23	Llansantffraid, Glyn Ceiriog, Wales—Additions to School	Education Authority	Headmaster, Council School, Llansantffraid, Glyn Ceiriog
,, 23	Lancaster—Park Structure	——	Borough Surveyor's Office, Lancaster.
,, 24	Middlesbrough—Schools	Education Committee	R. Lofthouse & Son, 62 Albert Road, Middlesbrough.
,, 24	Dorchester—Repairs at Police Station	Standing Joint Committee	E. A. Ffooks, Sherborne.
,, 24	Rhyl, North Wales—Library	Urban District Council	A. A. Goodall, Council Offices, Clwyd Street, Rhyl.
,, 26	Barry—Masonic Hall	——	J. A. Owen, Main Street, Cadoxton, Barry.
,, 27	Bromley, Middlesex—Works to Operating-room	Managers, Sick Asylum District.	J & W. Clarkson, 136 High Street, Poplar.
,, 27	Caerphilly—Hospital	Urban District Council	U.D.C. Offices, Caerphilly.
,, 27	London, W.C.—Patent Office Extension	Commissioners	Secretary, H.M. Office of Works, Storey's Gate, S.W.
,, 27	Bexhill—School	Education Committee	Secretary, Education Committee, Amherst Road, Bexhill.
,, 30	Willesden—Repairs to School	Education Committee	G. E. T. Lawrence, 22 Buckingham Street, Adelphi.
July 1	Prestwick, Ayr—Twelve Houses	C. W. Andrew	A. L. Mercer, Ayr.
,, 3	Tipton—Alterations to Schools	Education Committee	A. Long, 21 New Street, West Bromwich.
,, 5	Bristol—New Schools	Education Committee	W. B. Wood, 12 Queen Street, Gloucester.
,, 5	Prestwick, Ayr—Six Pairs of Semi-detached Cottages	Wyllie & Co.	A. L. Mercer, Ayr.
,, 6	Gainsborough—School	Education Committee	Scorer & Gamble, Bank Street Chambers, Lincoln.
	ENGINEERING:		
June 15	Pentre, Glam.—Steel Tank	Rhondda U.D.C.	O. Thomas, Gas and Water Offices, Pentre.
,, 15	Ribera, Sicily—Aqueduct	——	Municipality, Ribera, Sicily.
,, 15	Edinburgh—Heating Installation	Parish Council	R. M. Cameron, 53 Great King Street, Edinburgh.
,, 15	Ilford—Refuse Destructor	Urban District Council	Herbert Shaw, Town Hall, Ilford.
,, 16	Wirral, Cheshire—Sewers	Rural District Council	F. E. Priest, 13 Harrington Street, Liverpool.
,, 16	Rio de Janeiro, Brazil—Engines and Tools	——	Intendenciada Estrada de Ferro Central do Brazil.
,, 17	St. Mawes, Cornwall—Sea-Wall, &c.	——	Coastguard Boathouse, St. Mawes.
,, 17	Woodhall Spa, Lincs—Septic Tanks	Urban District Council	E. E. T. Bolton, Woodhall Spa.
,, 19	Antwerp—Heating Apparatus	Commercial Intelligence Branch of Board of Trade.	Offices of Commercial Intelligence Branch of Board of Trade, 73 Basinghall Street, E.C.
,, 19	Bury, Lancs—Extension of Railway Bridge	Gas Committee	H. Simmonds, Gasworks, Bury.
,, 19	Pontardawe, Wales—Water Mains	Rural District Council	Surveyor's Office, Herbert Chambers, Pontardawe.
,, 19	Brigg, Lincs—Pipe-laying	Urban District Council	A. Atkinson, Brigg.
,, 21	Hoyland Nether, near Barnsley—Alteration to Sewage Tanks.	Urban District Council	H. G. Keywood, Town Hall, Hoyland Nether.
,, 22	Cricklewood, Middlesex—Reservoir, &c.	Metropolitan Water Board	District Secretary, New River District Offices, 173 Rosebery Avenue, E.C.
,, 26	Edinburgh—Inclined Retort Carbonizing Plant	Gas Commissioners	W. R. Herring, New Street Works, Edinburgh.
,, 27	Southampton—Weighbridge	Corporation	J. A. Crowther, Borough Engineer, Southampton.
,, 27	Tendring, Colchester—Heating Workhouse, &c.	Guardians	Price & Belsham, 52 Queen Victoria Street, E.C.
	IRON AND STEEL:		
June 15	Chelmsford—Galvanized-Iron Tubes, &c.	Corporation	Borough Surveyor, 16 London Road, Chelmsford.
,, 17	Skipton—Water Mains	Urban District Council	J. Mallinson, Town Hall, Skipton.
,, 19	Kendal—Railing	Corporation	Borough Engineer's Office, Town Hall, Kendal.
,, 19	Keighley—Pipes, &c.	Gas Committee	John Laycock, Gas Office, Cook Lane, Keighley.
,, 19	Aberdare—Iron, &c.	Powell Duffryn Steam Coal Co.	Stores Manager, Aberaman Offices, near Aberdare.
,, 24	Nottingham—Cast-iron Pipes, &c.	Water Committee	F. W. Davies, St. Peter's Church Side, Nottingham.
	PAINTING AND PLUMBING:		
June 16	Merthyr Tydfil—Painting Wood and Ironwork at Infirmary.	Guardians	T. Roderick, Aberdare.
,, 17	Blackburn—Decorationg Interior of School	Education Committee	Office of Technical School, Blackburn.
,, 17	Whittingham, Preston—Outside Painting, &c.	——	Asylum, Whittingham.
,, 19	Halifax—Colouring, &c., at Schools	Education Committee	J. Lord, Town Hall, Halifax.
,, 19	West Ham—Painting, &c., Schools	Education Committee	William Jacques, 2 Fen Court, E.C.
,, 19	Portsmouth—Painting, &c., Schools	Education Committee	A. H. Bone, Cambridge Junction, Portsmouth.
,, 19	Stratford, E.—Painting, &c., at School	Education Committee	W. Jacques, 2 Fen Court, E.C.
,, 20	Blackburn—Painting Outside Woodwork at Electricity Works.	Electricity Committee	P. P. Wheelwright, Electricity Works, Jubilee Street, Blackburn.
,, 20	Carlisle—Painting at School	Education Committee	Henry C. Marks, 35 Fisher Street, Carlisle.
,, 20	London, S.W.—Painting, &c., at Infirmary	Guardians	J. Dowling, Clerk, Workhouse, Cale Street, Chelsea, S.W.
,, 21	Hull—External Painting of Fifteen Schools and Whitewashing Twelve.	Education Committee	Education Offices, Albion Street, Hull.
,, 26	London, W.—Painting at Infirmary	Guardians	E. H. Sim, 8 Craig's Court, Charing Cross.
,, 26	London, W.—Painting at Schools	Guardians	Superintendent of Schools, Southall.
,, 27	Leyton—Painting at Schools	Urban District Council	W. Jacques, 2 Fen Court, E.C.
July 3	Ecclesfield—Painting, &c., at Schools	County Council	W. Hague, Ecclesfield.
	ROADS AND CARTAGE:		
June 16	Shettleston, N.B.—Concrete Paving	School Board	Office of Clerk to Board, 24 St. Vincent Place, Glasgow.
,, 17	Northwood, Middlesex—Broken Granite, &c.	Urban District Council	W. L. Carr, Council Offices, Northwood, Middlesex.
,, 17	Leigh, Lancs—Granite Setts	Corporation	Tom Hunter, Bank Chambers, Leigh, Lancs.
,, 19	Preston, Lancs—Street Works	Corporation	Borough Surveyor, Town Hall, Preston.
,, 19	London, N.—Making-up Streets	Urban District Council	Engineer and Surveyor, Council Offices, Finchley, N.
,, 19	Romford—Kerbing, &c.	Rural District Council	G. Lapwood, Highway Surveyor, Victoria Road, Romford.

Complete List of Contracts Open.—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	ROADS AND CARTAGE—*cont.*		
June 19	York—Private Street Works	Corporation	City Engineer's Office, Guildhall, York.
,, 19	Ebbw Vale, Mon.—Road Widening	Urban District Council	T. J. Thomas, Engineer and Surveyor, Ebbw Vale.
,, 20	Romford—Making-up Eight new Streets	Rural District Council	E. G. Boden, Victoria Chambers, Victoria Road, Romford.
,, 21	Bournemouth—Making-up Roads	Corporation	F. W. Lacey, Borough Engineer, Bournemouth.
,, 21	Lanchester—Heightening Road	Rural District Council	W. Cumming, Surveyor's Office, Lanchester.
,, 23	Wotton, near Gloucester—Road Works	Rural District Council	F. E. Weaver, Lipton Chambers, Northgate Street, Gloucester.
,, 23	Brighton—Portland Cement	Town Council	Borough Engineer, Town Hall, Brighton.
,, 25	Beckenham—Making-up Roads	Urban District Council	J. A. Angell, Surveyor, Beckenham.
,, 26	Witham—Slag, &c.	Urban District Council	W. B. Blood, Council Office, Witham.
,, 26	Feltham—Granite	Urban District Council	R. T. Stewart, Town Hall Chambers, Feltham.
,, 27	Leyton—Tar Paving	Urban District Council	W. Jacques, 2 Fen Court, E.C.
	SANITARY:		
June 16	Cupar, N.B.—Sewage-disposal Works	Town Council	H. Bruce, 67 Crossgate, Cupar, Fife.
,, 22	West Malling, Kent—Sewerage Works	Rural District Council	W. L. Grant, High Street, Sittingbourne, Kent.
,, 23	Askern, Yorks—Sewerage Works	Rural District Council	D. Balfour & Son, 3 St. Nicholas Building, Newcastle.
July 4	London, S.E.—Sewers	London County Council	Maurice Fitzmaurice, County Hall, Spring Gardens, S.W.
	TIMBER:		
June 15	Cardiff—Pitwood	Nixon's Navigation Co.	Company's Office, Bute Docks, Cardiff.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Aug. 1	Hove, Sussex—Library	£50, £30, £20	£1 1s.	H. Endacott, Town Hall, Hove.
,, 1	Perth—Reconstruction of Hall	30, 20 and 10 guineas	——	J. Begg, City Chambers, Perth.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

G. HALL, builder, Bloxwich. R.O. June 1st.

W. S. HILDRED, builder and slater, Hull. R.O. June 3rd.

W. CHEESEMAN, builder and contractor, Hull. R.O. May 29th.

A. E. LONGDEN, building contractor, Bristol. Adj. May 31st.

C. YOUNG, road contractor, Yarlington. P.E., Yeovil Town Hall, July 6th, at 2.30.

W. WILKINSON, stonemason and builder, Lancaster. P.E., Preston Sessions Hall, July 7th, at 11.

S. HACKETT, general decorator, Stapleford. First meeting, O.R.'s, Derby, June 16th, at 12.30. P.E., Derby C.C., June 20th, at 11.

F. WILSON, builder, East Ham. R.O. June 1st. First meeting, London Bankruptcy Court, June 16th, at 11. P.E., same, July 18th, at 11.30.

H. GILMAN, joiner and builder, Nottingham. First meeting, O.R.'s, Nottingham, June 16th, at 11. P.E., Nottingham C.C., July 7th, at 10.

G. L. SHEPHERD & Co., builders, Bournemouth. First meeting, O.R.'s, Southampton, June 17th, at 11.30. P.E., Poole Town Hall, July 5th, at 11.30.

F. HOLGATE, painter and decorator, Calverley. R.O. June 1st. First meeting, O.R.'s, Bradford, June 19th, at 3. P.E., Bradford C.C., June 21st, at 10.

T. EVANS, joiner, Cardiff. R.O. May 29th. First meeting, 117, St. Mary Street, Cardiff, June 14th, at 11. P.E., Cardiff Town Hall, July 4th, at 11.

M. J. MORGAN, builder and contractor, Boverton, near Cardiff. First meeting, 117, St. Mary Street, Cardiff, June 15th, at 12. P.E., Cardiff Town Hall, July 4th, at 11.

POLLARD & Co., timber merchants, Stepney and Gravesend. R.O. May 29th. First meeting, London Bankruptcy Court, June 14th, at 12. P.E., same, July 14th, at 11.30.

FOWLER BROTHERS, decorators and building contractors, Stratford and Goodmayes. R.O. June 2nd. First meeting, London Bankruptcy Court, June 15th, at 11. P.E., same, July 6th, at 11.30.

Long Eaton Primitive Methodist Church and Schools.—The foundation-stone of these buildings was laid on June 6th. The church (which is the portion of the scheme at present in course of erection) will seat 500 persons. The architects are Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines, 5, Clement's Inn, Strand, W.C. The contract amount is for £2,544. It is let to Mr. John Bull, of Long Eaton.

Guaranteed Door Springs.

Guaranteed Gearing and Fittings.

New Catalogue
Post Free on Applicatioi

DOOR SPRINGS.

ROBERT ADAMS,
3 & 5, EMERALD STREET,
THEOBALD'S ROAD,
(New Address) W.C.

FANLIGHT OPENERS & GEARING.

Metal Sashes.

Panic Bolts.

Weather Bars.

Reversible Window Fittings, &c.

UNPRECEDENTED OFFER. As an advertisement, for a short time only we are giving away the 10/6 "Safety Pen" for 2/6

A great improvement upon all other Fountain Pens.

Latest Improved Twin Feed.

Unequalled for its Beauty—Smoothness in Writing—Regular Feeding in Ink—Easy to Fill—Easy to Handle—Easy to Write.
Sample Pens, 2/6; Usual Retail Price, 10/6. The 21/- Pen, Handsome Gold Mounted, for 5/-
Makers: E. NEWTON & Co., 63, Aldermanbury, London, E.C.

Advertising Notes.

Bunch your efforts. Strike early, often, and everlastingly, but be sure you are putting every blow in the same spot. Sheet lightning is showy, but it never sets a house on fire. It is the compact, concentrated forked brand that moves things.

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterward, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Monday.

ADVERTISER desires ENGAGEMENT in Architect and Surveyor's, Auctioneer's, or Contractor's Offices. General experience in architectural and surveying works, surveying and levelling, superintendence of works, contract drawings, details, specifications, and general routine.—Box 1156, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ADVERTISER seeks RE-ENGAGEMENT as WORKING or WALKING FOREMAN of PAINTERS. Good colourman and manager of men. Thoroughly reliable and trustworthy. Excellent W.E. references. Age 40. Total abstainer.—J. G., 31, High Street, Wandsworth, S.W. 1147

ARCHITECT and SURVEYOR'S ASSISTANT (23), 7 years' general experience, working drawings, specifications, quantities, levelling, surveying, &c. First-class testimonials. Certificates, Honours Building Construction, Architecture, &c. — Box 1166, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT and SURVEYOR'S ASSISTANT DISENGAGED. Twelve years' good general experience, quick and accurate draughtsman. Working and detail drawings, designs, surveys, specifications. Splendid testimonials. Salary moderate—A. R., Hazlemere, Rusham Road, Egham, Surrey. 1162

ARCHITECT and SURVEYOR'S ASSISTANT desires ENGAGEMENT; 12 years' experience in all branches of the profession, including Specifications, Quantities, Surveying, Levelling, &c.—Apply Box 1180, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S and SURVEYOR'S JUNIOR ASSISTANT (21) requires ENGAGEMENT. Working and detail drawings; good references: moderate salary.—Box No. 1191, BUILDERS' JOURNAL Office, 6, Great New Street, London, E.C.

ARCHITECT'S ASSISTANT (25) desires ENGAGEMENT. Specialities: Schools, Libraries, Domestic Work.—ARCHITECT, Fairlands, Epsom.

ARCHITECT'S ASSISTANT DISENGAGED. 7 years' good experience (24). Good construction, details, surveying and levelling, &c.; fair knowledge quantities. Moderate salary; good references. —F. G. R., 63, Pagoda Avenue, Richmond. 1175

ARCHITECTURAL ASSISTANT (26) wants POSITION in architect's (or engineer's) office. Seven years' experience. Working drawings and details, surveying, perspectives, etc.—A. E. P., 35, Carpenter Road, Edgbaston, Birmingham. 1189

ARCHITECT'S CLERK (22) seeks EMPLOYMENT. Good tracer; assist in surveying. 7 years' experience. Good ref.—C. L., 11, Herries Street, Queen's Park, London, W. 1165

ARCHITECT'S DRAUGHTSMAN wants SITUATION in office or works; eight years' experience; north preferred; 35s. salary.—Box 1164, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S JUNIOR ASSISTANT (22) requires ENGAGEMENT in London. Salary 25s. Working and detail drawings. Measuring old work. Knowledge of surveying, &c. Good references.—E. J. C., "Beaconsfield," Kew Green, Surrey. 1176

BUILDER'S ASSISTANT desires ENGAGEMENT. Well up in accounts, prime cost, measuring, and usual office routine. Assist estimating and quantities.—F. J. L., 53, Maidstone Road, Chatham. 1167

BUILDER'S CLERK, experienced, double entry book-keeping, time sheets, correspondence and general routine. Plans, &c. Town or country. Moderate salary.—E. W. H., 11, Archibald Road, Tufnell Park, N. 1177

BUILDER'S CLERK (26) requires SITUATION; estimating, quantities, drawing; moderate salary.—H. D., 3, Mildmay Road, Romford. 1169

BUILDER'S, &c. CLERK OF WORKS ASSISTANT (22); drawing, tracing, knowledge quantities and details; 4½ years in architect's office; certificates, building construction, advanced, 1st freehand, &c.—H. M. N., Thorncroft, Farnham, Surrey. 1187

CARPENTER and JOINER. Abstainer. Age 26; wants piecework; any distance; or take charge of shop (hand or machine) or as General Foreman or Manager on estate; have had experience in all above. —A. W., 6, Beaconsfield Road, Southall. 1155

COMPETENT ASSISTANT desires ENGAGEMENT; 12 years' first-class experience; various branches of architectural work; town or country. Excellent testimonials.—S., 76, Belsize Road, N.W. 1158

ESTATE CLERK of WORKS seeks ENGAGEMENT. Plans, measurements, accounts. Long experience. Country preferred. Good references. —Address Box 1159, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

HOT WATER FITTER requires SITUATION; good references; has taken charge of work.—T. S., 70, Gordon Road, Ilford. 1179

IMPROVER requires ENGAGEMENT. 4½ years' experience. Good draughtsman, &c; moderate salary.—Apply, H. LUCKMAN, St. Andrew's Road S., St. Anne's-on-the-Sea. 1174

JUNIOR ASSISTANT disengaged; smart draughtsman, tracer, colourist: salary 20s.—Address MONNION, 219, Brixton Road, S.W. 1182

MACHINIST (24), seeks JOB. Planing machine, circular saw and band saw. Experienced with gas-engine.—P. LOCK, 139, Cornwall Road, Bayswater. 1152

MACHINIST JOINER wants JOB. Good all-round hand. Well up with spindle and four-cutter. Town and country experience; take charge if required; good references; age 39.—Machinist, 54, Monson Road, Redhill, Surrey. 1157

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SEE PAGES XVII and XXII FOR EMPLOYMENT REGISTER.

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June 17th. Third Summer Visit to St. Alban's Abbey, P.O. for 3s. 6d. (including rail and tea) to be sent to the Secretary, 18, Tufton Street, S.W., before June 14th. Members to meet at the Booking Hall, Euston Station at 1.10 p.m. for the 1.23 p.m. train.

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War Office,
Pall Mall, S.W. 3rd June, 1905.

HERTFORDSHIRE COUNTY COUNCIL.

NEW PETTY SESSIONAL COURT AND TECHNICAL SCHOOL, CHESHUNT.

The Joint Committee for purposes of Police are prepared to receive TENDERS for the erection and completion of a new Petty Sessional Court and Technical School, Cheshunt.

Persons desirous of Tendering for the work may see the drawings, specification, agreement, &c., at the County Surveyor's Office, Hatfield, on and after Tuesday, June 13th, 1905, between the hours of TEN a.m. and FOUR p.m., except on Saturday, when they will be on view from TEN a.m. to ONE p.m.

A copy of the Schedule of Works and prices (quantities), and a form of Tender can be obtained at the County Surveyor's Office upon payment of Two Guineas, which sum will be returned to the tenderer upon receipt of a bonâ fide Tender and the documents which have been supplied to him.

Sealed Tenders endorsed "Tender for Petty Sessional Court, Cheshunt," must be delivered to the undersigned at his Offices, not later than 5 p.m., Monday, June 26th, 1905.

Such security for the due execution of the works as the Council may require must be given by the Contractor.

The lowest or any Tender will not necessarily be accepted.

URBAN A. SMITH,
County Surveyor.

County Surveyor's Offices,
Hatfield,
9th June, 1905.

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3. Correspondents are particularly requested to be as brief as possible.

4. The querist's name and address must always be given, not necessarily for publication.

Note.—Owing to the large number of enquiries we receive weekly, we are compelled to restrict the advantages of this department to Regular Readers.

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We mean by a Regular Reader anyone who has placed an order with us or any newsagent or bookstall for the BUILDERS' JOURNAL for one year.

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Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Baildon (Yorks).—Accepted for the erection of a villa residence and appurtenances in West Lane. Mr. J. Harper Bakes, architect, Calverley Chambers, Victoria Square, Leeds:—

Mason—Taylor & Ellis.
Joiner—A. Parker.
Plumber and painter—A. Higginbotham & Sons.
Roof tiler—Pickles Brothers.
Plasterer—W. Holmes.

[Total, £1,332.]

Barking.—For the erection of three flats at Kennedy Road, for Mr. R. Bennett. Mr. J. M. H. Gladwell, architect, Essex House, High Street, Stratford, E.:—

H. E. Jones	£1,133
Calcutt	1,131
North	1,095
Bull	1,080
Groome	1,050

Bourne (Lincs).—For the erection of fourteen cottages, for Mr. R. A. Collins. Mr. F. G. Shilcock, architect, Bourne:—

G. Hawley, Buckminster	£2,395	0	0
H. Peake, Peterborough	2,000	0	0
Wyke & Sons, Peterborough	1,890	0	0
J. H. Clayton, Leicester	1,876	0	0
W. T. Walker, Old Leake	1,820	0	0
Hipwell & Co., Wisbech	1,755	10	0
Scotney & Co., Bourne	1,715	0	0
F. Johnson, Spalding	1,700	0	0
Cave, Scotney & Co., Bourne	1,680	0	0
Gelsthorpe & Sons, Bourne	1,540	0	0
Roberts Brothers,* Peterborough	1,410	9	9

* Accepted.

NOTE.—Bricklayer, plasterer and carpenter only.

Carlton (near Nottingham).—For the erection and completion of a free public library and caretaker's house in Station Road, for the Carlton U.D.C. Mr. J. C. Haller, C.E., engineer and surveyor:—

Hutchinson & Son, Nottingham	£2,390	0	0
J. & J. Warner, Mickleover	2,387	0	0
W. Maule & Co., Nottingham	2,320	0	0
F. Messon, Nottingham	2,290	0	0
T. H. Harper, Carlton	2,191	0	0
J. H. Wood, Leeds	2,153	0	0
T. Cuthbert & Son, Nottingham	2,155	10	0
S. Loach, Carlton	2,010	9	0
G. T. Tegerdine,* Urban Road, Carlton, Notts	1,960	0	0
J. Young, Derby	1,780	0	0

* Accepted.

Charlbury (Oxon).—For additions and alterations to Charlbury Council Schools, and the erection of teacher's residence, for the Oxfordshire County Council Education Committee. Messrs. Tollit & Lee, architects and surveyors, 7, St. Aldate's Street, Oxford:—

C. Pether	£3,105	7	0
J. Wooldridge	2,957	0	0
T. H. Kingerlee	2,840	0	0
S. Hutchins	2,779	0	0
Organ Brothers	2,733	0	0
Wastic Brothers	2,700	0	0
Bartlett Brothers	2,587	5	3
Groves & Sons	2,586	0	0
T. Burden,* Chipping Norton	2,574	17	1

* Accepted

Ebbw Vale (Mon.).—For the erection of a new chapel and schoolroom in Mount Pleasant Road, for the Trustees of Nebo Baptist Church. Mr. H. Waters, architect, Beaufort:—

D. Morgan	£2,934	0	0
Rowlands & Davies,* Waunlwyd, Mon.	2,732	10	0
S. Evans	2,721	18	2
J. T. James	2,670	10	0

* Accepted.

Great Baddow (Essex).—For the erection of seven cottages in Beehive Lane. Mr. R. Mawhood, architect, Chelmsford:—

Baker & Sons	£1,898
J. Rayner	1,695
J. Gowers	1,575
F. Cracknell,* Great Baddow	1,565

* Accepted.

Great Missenden (Bucks).—For the erection of two houses, for Mr. Alfred Dunhill. Mr. J. Bruce Merson, architect, 76, High Road, Kilburn, N.W.:—

H. J. Wright	£2,178	0	0
G. Parsons	2,149	0	0
Aldridge & Son*	2,115	0	0
M. Dymock	1,961	15	0

* Accepted.

Halesworth (Suffolk).—For the erection of a house and shop in Bridge Street, for Mr. C. H. Ives. Mr. A. Pells, architect, Beccles:—

Maxey & Son	£1,335
Woodyard	1,200
Howard Brothers,* Halesworth	1,060

* Accepted subject to slight alteration.

London, E.—For repairs and decorations to the "Hulse Arms," Ilford. Mr. Herbert Riches, architect, 3, Crooked Lane, King William Street, E.C.:—

A. W. Derby	£178	0	0
Sheffield Brothers	160	0	0
F. & A. Willmott	146	0	0
Clemens Brothers*	145	10	0

* Accepted.

London, E.—For alterations and additions at the Custom House Hotel, Custom House, E., for Mr. H. Elliston. Mr. J. M. H. Gladwell, architect, Essex House, High Street, Stratford, E. Quantities by Mr. L. E. G. Collins, 31, Great St. Helens, E.C.:—

Newman & Todd	£7,396
Harris & Wardrop	7,200
Pringle	7,050
Harper	6,853
Sheffield Brothers	6,795
Hibberd Brothers	6,781
W. J. Maddison	6,598

London, S.E.—For the erection of stores, offices, &c., on the site of 47 to 51, Hatfield Street, Southwark. Mr. A. Conder, architect, Palace Chambers, Westminster:—

Trollope & Colls, Ltd.	£9,545
T. Rider & Son	9,456
McCormick & Son	9,409
L. H. & R. Roberts	9,368
J. Mowlem & Co.	9,163
E. Lawrance & Son	9,025
Higgs & Hill, Ltd.	8,994
W. Cubitt & Co.	8,991
H. Young	8,973
Holland & Hannen	8,875
J. Grover & Son*	8,663

* Accepted.

London, S.W.—For iron buildings at Broomwood Road School, Clapham, for the London County Council Education Committee:—

Mitson & Harrison, Camberwell	£1,800	0	0
T. J. Hawkins & Co., Ashford	1,789	10	0
T. Cruwys, Camden Town	1,784	0	0
R. Iles, Ltd., Walham Green	1,775	0	0
Humphreys, Ltd., Knightsbridge	1,620	0	0
A. Leather, Wandsworth	1,570	0	0
W. Harbrow, South Bermondsey Station	1,559	0	0
J. McManus,* 237, Hammersmith Road	1,405	0	0

* Recommended for acceptance.

London, E.—For alterations to saloon bar of the "Bow Bells," Bow. Mr. Herbert Riches, architect, 3, Crooked Lane, King William Street, E.C.:—

T. Osborn & Sons	£217
J. T. Robey*	200

* Accepted with small modifications.

London, N.E.—Accepted for work at the "Sebright" music-hall, Bethnal Green. Mr. Herbert Riches, architect, 3, Crooked Lane, William Street, E.C.:—

Kirk & Kirk (builders' work)	£290	0	0
Merryweather & Sons, Ltd. (fire mains, &c.)	59	18	0

London, N.E.—Accepted for work to shop premises, Lower Clapton. Mr. Herbert Riches, architect, 3, Crocked Lane, King William Street, E.C.:—

J. T. Robey	£99	10	0

London, N.W.—For the erection of laundry and housewifery centres at Manchester Street school, St. Pancras, for the London County Council Education Committee:—

Staines & Son, 61, Great Eastern Street	£2,789	0	0
T. L. Green, Holborn	2,787	0	0
J. Peattie, Baker Street	2,754	11	0
W. Shurmur & Sons, Ltd., Upper Clapton	2,745	0	0
G. S. S. Williams & Son, Barnsbury	2,727	0	0
General Builders, Ltd., Notting Hill	2,678	0	0
G. Appleby & Sons, Lambeth	2,658	0	0
Stevens Brothers, 1A, Yonge Park	2,656	0	0
Marchant & Hirst, 136, Highgate Road	2,638	0	0
J. Grover & Son, New North Road	2,638	0	0
L. H. & R. Roberts, Islington	2,625	0	0
J. Willmott & Sons, Hitchin	2,600	0	0
E. Lawrance & Sons, 14–16, Wharf Road, N.	2,503	0	0
G. Neal,* Willesden Lane	2,465	0	0

* Recommended for acceptance.

London, S.E.—For improvements at the South Lambeth Road school, Kennington, for the London County Council Education Committee:—

J. Grover & Son, New North Road	£15,984
W. Downs, Hampton Street, Walworth	15,944
F. & H. Higgs, Herne Hill	15,882
Patman & Fotheringham, Ltd., Islington	15,723
Lathey Brothers, Battersea Park	15,483
Killby & Gayford, Finsbury	15,359
Clarke & Bracey, 64, Coleman Street	15,118
J. Greenwood, Ltd., 10, Arthur Street West	14,959
W. King & Son, 3, Vauxhall Bridge Road	14,773
J. & C. Bowyer, Upper Norwood	14,587
H. L. Holloway, Deptford	14,546
Lawrance & Sons, 14–16, Wharf Road, N.	14,404
Treasure & Son, Upper Holloway	14,383
J. & M. Patrick, Wandsworth	14,270
W. Johnson & Co., Ltd., Wandsworth Common	14,151
J. Appleby & Sons, Lambeth	14,089
W. Smith & Son, Harleyford Road	14,088
J. Marsland & Sons, Walworth	13,855
J. Garrett & Son, 17, Balham Hill	13,773
E. Triggs,* 92, The Chase, Clapham	13,386

* Recommended for acceptance.

Liverpool.—For the erection of the north homœopathic dispensary, Roscommon Street. Mr. F. U. Holme, architect, Liverpool:—

Jones & Sons	£2,500
Wearing & Sons	2,010
Holme & Green	1,984
S. Webster	1,945
H. E. B. Greene	1,935
Hughes & Stirling	1,865
W. Hall & Son	1,798
J. & E. Rimmer	1,760

Nottingham.—Accepted for the erection of four houses in Meadow Lane. Mr. H. Allcock, architect, Nottingham:—

T. Fish & Son	£1,186	6	0

Nottingham.—For the erection of four houses in Colwick Road and Meadow Lane. Mr. H. Allcock, architect:—

F. Messom	£1,825
H. Vickers & Son	1,793
T. Whittaker	1,750
F. Wright	1,725
A. B. Clarke	1,720
F. Booth	1,714
J. G. Short	1,697
G. A. Pillatt	1,661
T. Barlow	1,660
W. & J. Simons	1,655
G. Sadler	1,650
G. Lovell	1,650
Richardson & Hewerdine	1,629
Fish & Son*	1,615
Crane & Co.	1,598
J. Wright	1,595

* Accepted.

Pontnewydd.—For pulling down and rebuilding the King's Head Hotel, and forming roads and sewers, for Messrs. Phillips & Sons, Ltd. Messrs. Swalwell & Havard, architects, Steam Packet Chambers, Dock Street, Newport, Mon.:—

Poulton & Whiting, Pontnewydd	£4,155	0	0
D. W. Pugh & Co.	4,001	6	6
J. Linton & Co., Ltd.	3,900	0	0
W. Jones & Son, Ltd.	3,817	0	0
J. Jenkins & Co.	3,804	0	0
D. W. Richards & Co., Ltd.	3,798	0	0
C. Lock & Co., Ltd.	3,785	0	0
F. Powles & Co.	3,777	0	0
Clements & Co., Ltd.	3,732	0	0
G. H. Reed & Co.	3,500	0	0
E. C. Jordan & Co.	3,487	0	0
Dean & Co., Ltd.	3,407	0	0
A. S. Morgan & Co., Ltd.,* Godfrey Road, Newport, Mon.	3,374	5	11

* Accepted. [Rest of Newport.]

Reigate.—For constructing a new arch at Pym's siding and other works in Wray Common Road, for the Council. Mr. Fred T. Clayton, borough surveyor. Quantities by surveyor:—

Hewett & Sons (Barking), Ltd.	£1,292	2	3
S. Jeal	1,196	0	0
G. S. Faulkner	1,173	1	7
J. J. Pink	1,139	0	0
C. Nightingale & Sons	1,088	0	0
E. Worssell,* Redhill	1,040	0	0

* Accepted.

Southampton.—For converting Nos. 102, 104, 106 and 108, Above Bar into business premises, for Messrs. Smith, Bradbeer & Co., Ltd. Mr. William Burrough Hill, F.S.I., architect, Southampton:—

J. J. Udall & Co.	£3,305	16	0
Dyer & Sons	3,070	0	0
D. Drake, Bournemouth	2,875	0	0
Jenkins & Sons	2,764	0	0
Playfair & Toole	2,727	0	0
H. Stevens & Co.	2,544	0	0
A. Wright & Son	2,495	0	0
H. Cawte*	2,431	0	0

* Accepted. [Rest of Southampton.]

Stafford.—For the Sir Thomas Salt memorial additions to the grammar school. Mr. Henry T. Sandy, architect, 22, Greengate, Stafford:—

G. Dyke	£1,718	9	0
G. H. Marshall, Smethwick	1,631	0	0
F. Espley & Sons	1,598	0	0
G. Hodges, Burton-on-Trent	1,598	0	0
T. Lowe & Sons, Burton-on-Trent	1,590	0	0
T. Moss, Stone, Staffs	1,547	0	0
C. J. Nevitt	1,539	9	8
Jervis Brothers	1,490	0	0
Adams & Pemberton*	1,489	0	0

* Accepted. [Rest of Stafford.]

Sutton.—For the erection of proposed telephone exchange, for H.M. Office of Works:—

C. Ansell	£1,387
E. Streather	1,354
Banyard & Son	1,300
J. Smith & Sons, Ltd.	1,298
Enness Brothers	1,292
F. G. Lawrence	1,288
F. J. Shopland	1,277
J. B. Potter	1,275
Higgs & Outhwaite	1,275
E. M. Bulled & Co.	1,273
R. Dean & Co.	1,260
W. H. Lorden	1,259
Smith & Sons	1,238
Martin, Wells & Co., Ltd.	1,220
H. M. Patrick	1,207
Gathercole Brothers	1,200
A. N. Coles	1,155

Tipperary.—Accepted for the erection of six houses on the estate of the Right Hon. Lord Barrymore. Messrs. W. H. Hill & Son, architects, 28, South Mall, Cork:—

M. Kirby, Tipperary	£1,725

Woodford.—Accepted for the erection of a detached house. Mr. Herbert Riches, architect, 3, Crooked Lane, King William Street, E.C.:—

T. Osborn & Sons	£1,268

The new North Pier at Seaham Harbour is now completed, with the exception of the lighthouse. It is 1,383ft. long. The south pier, which is 878ft. long, will also be completed soon.

Newcastle Slaughter-houses.—It is proposed to erect twenty-one new slaughter-houses at the Newcastle cattle markets. The majority will be 18ft. square. The building will be constructed with red pressed bricks outside, lined inside with white glazed bricks. The estimated cost of the scheme is £3,166.

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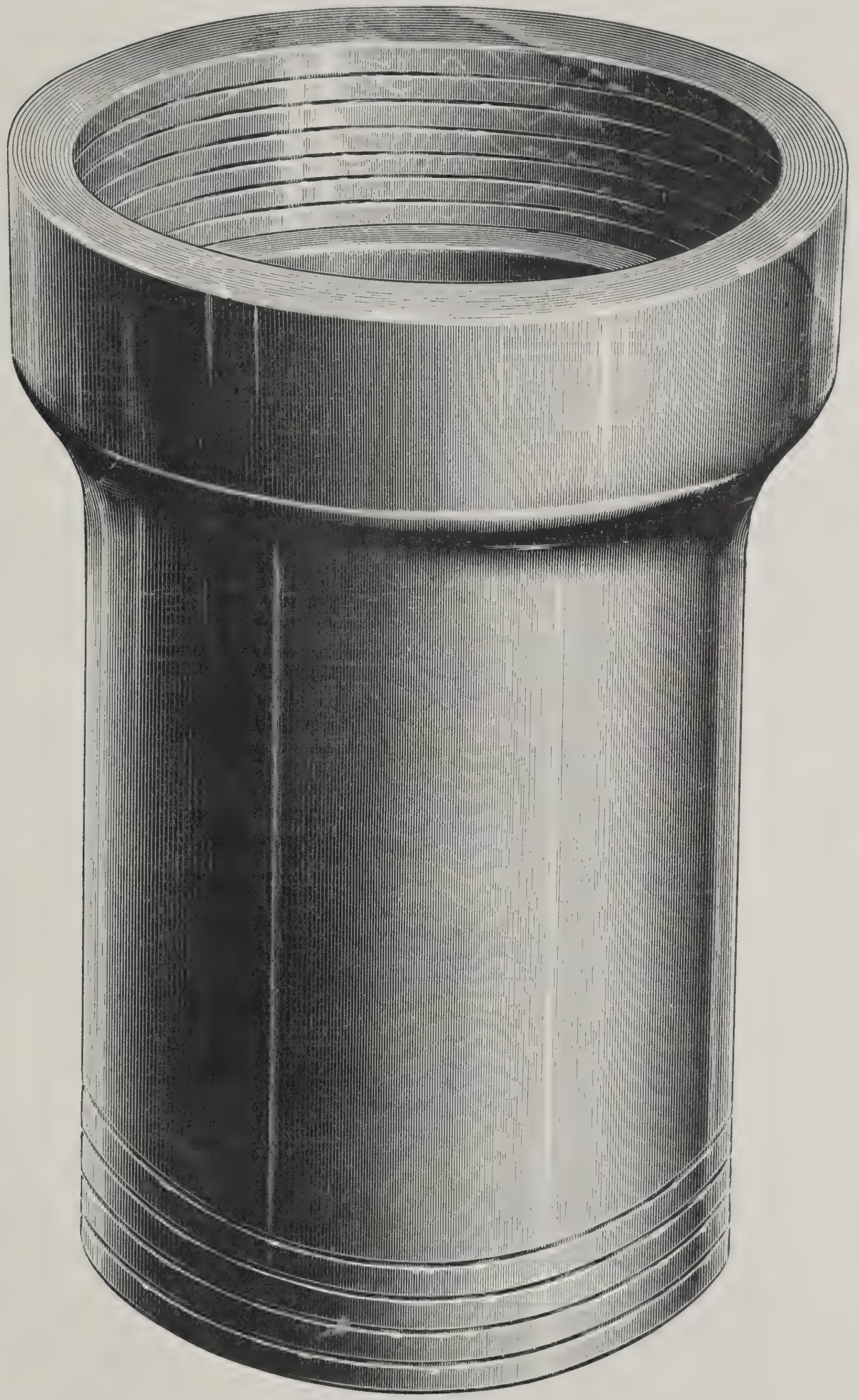

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Current Market Prices.

FORAGE.

		£ s. d.	£ s. d.
Beans	per qr.	1 10 0	1 13 0
Clover, best	per load	3 15 0	4 2 6
Hay, good	do.	3 10 0	3 15 0
Sainfoin mixture ...	do.	3 10 0	3 17 6
Straw	do.	1 12 0	2 0 0

OILS AND PAINTS.

Castor Oil, French ...	per cwt.	1 0 5	—
Colza Oil, English ...	do.	1 3 6	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 15 0	2 17 0
Lead, white, ground, carbonate	per ton	16 0 0	—
Do. red	do.	15 0 0	—
Linseed Oil, barrels ...	per cwt.	1 0 0	—
Petroleum, American ...	per gal.	0 0 $5\frac{1}{8}$	—
Do. Russian ...	do.	0 0 $4\frac{3}{4}$	—
Pitch	per barrel	0 8 0	—
Shellac, orange	per cwt.	6 15 0	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Town	per cwt.	1 4 0	1 4 6
Tar, Stockholm	per barrel	1 6 6	—
Turpentine	per cwt.	3 0 0	—

METALS.

Copper, sheet, strong ...	per ton	80 0 0	—
Iron, Staffs., bar ...	do.	5 15 0	8 0 0
Do. Galvanized Corrugated sheet ...	do.	10 10 0	—
Lead, pig, Soft Foreign...	do.	12 18 9	—
Do. do. English common brands	do.	13 3 9	13 5 0
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14 0 0	—
Do. pipe	do.	15 0 0	—
Nails, cut clasp, 3in. to 6in.	do.	9 5 0	—
Do. floor brads... ...	do.	9 0 0	—
Steel, Staffs., Girders and Angles	do.	5 7 6	5 12 6
Do. do. Mild bars ...	do.	6 0 0	6 5 0
Tin, Foreign	do.	136 7 6	136 17 6
Do. English ingots ...	do.	137 0 0	139 0 0
Zinc, sheets, Silesian ...	do.	26 5 0	—
Do. do. Vielle Montaigne	do.	26 10 0	—
Do. Spelter	do.	23 15 0	24 0 0

TIMBER.

Soft Woods.

		£ s d.	£ s. d.
Fir, Dantzic and Memel	per load	2 10 0	4 15 0
Pine, Quebec, Yellow ...	do.	4 0 0	7 10 0
Do. Pitch, American	do.	2 8 0	5 0 0
Laths, log, Dantzic ...	per cu. fath.	4 0 0	6 0 0
Deals, Kemi Yellow, 1st & 2nd, 4×11	per std.	11 0 0	—
Do. do. do. do. 3×9	do.	10 5 0	—
Do. do. do. do. 2×9	do.	10 15 0	—
Do. Soderhamn, Yellow, 4th, 4×9	do.	11 15 0	—
Do. St. Petersburg, Yellow, 1st, 3×11	do.	16 10 0	—
Do. Kem, Yellow, 1st, 3×9	do.	18 10 0	—
Deals, Nederkalix, Yellow, 1st, 3×9	per std.	11 15 0	—
Do. Umba, Yellow, 4th, 3×9	do.	8 10 0	—
Do. Gefle, Yellow, 3rd, 3×9	do.	11 10 0	—
Do. Sandarne, Yellow, 5th, $2\frac{1}{2}$×7	do.	8 10 0	—
Do. Quebec and Saguenay, Spruce, 3rd, 3×9	do.	8 15 0	—
Do. St. John, Spruce, 1st, 2nd & 3rd, unsorted ...	do.	7 10 0	—
Battens, all kinds ...	do.	6 0 0	13 0 0
Flooring Boards 1in. prepared, 1st... ...	per square	0 10 6	—
Do. 2nd	do.	0 8 3	—
Do. 3rd, &c.	do.	0 6 6	0 9 6

Hard Woods.

Ash, Quebec	per load	3 17 6	7 5 0
Birch, New Brunswick...	do.	2 10 0	5 0 0
Do. Quebec do. ...	do.	2 10 0	5 15 0
Box, Turkey	per ton	7 0 0	20 0 0
Cedar, Cuba	per ft. sup.	0 0 $3\frac{1}{2}$	0 0 $3\frac{1}{2}$
Do. Honduras ...	do.	0 0 $3\frac{1}{2}$	—
Do. Tobasco	do.	0 0 $3\frac{3}{4}$	—
Elm, Quebec	per load	4 0 0	8 10 0
Jarrah, planks	per ft. cu.	0 2 6	0 3 0
Mahogany, Average Price for Cargo, Honduras...	per ft. sup.	0 0 $3\frac{1}{32}$	—
Do. Tobasco ...	do.	0 0 $4\frac{27}{32}$	—
Do. Cuba ...	do.	0 0 $2\frac{27}{32}$	—
Do. African ...	do.	0 0 $2\frac{29}{32}$	—
Oak, Wainscot	per log.	3 5 0	7 5 0
Teak, Indian, logs ...	per load	10 0 0	18 15 0
Do. do. planks ...	do.	13 0 0	20 5 0
Whitewood, American, logs.	per ft. cu.	0 1 3	0 1 6
Do. do. planks and boards	do.	0 1 3	0 3 9

Coming Events.

Wednesday, June 14.
Chemical Society.—Meeting at Burlington House at 5.30 p.m.

Friday, June 16.
Royal Sanitary Institute.—Discussion on "Sanatoria for Consumption: Design and Location," at 4.30 p.m.

Saturday, June 17.
Royal Sanitary Institute.—Visit to the Heatherside Sanatorium at Frimley (Mr. Edwin T. Hall, F.R.I.B.A., architect). Train leaves Waterloo 11.50 a.m.

Architectural Association.—Third Summer Visit, to St. Albans Abbey. Train leaves Euston 1.23 p.m.

Monday, June 19.
Royal Institute of British Architects.—Presentation of the Royal Gold Medal at 8 p.m.

Tuesday and Wednesday, June 20 & 21.
Institution of Heating and Ventilating Engineers.—Meeting at Bristol.

Wednesday June 21.
Institute of Sanitary Engineers.—Examination and Literary Committee at 3.30 p.m. Finance Committee at 5 p.m. Half-yearly General Meeting at 7 p.m.

Thursday to Saturday, June 22, 23 & 24.
Incorporated Association of Municipal and County Engineers.—Annual Meeting at Norwich.

New Companies.

William Gardam and Sons, Ltd., timber merchants, sawmill proprietors, &c. Capital: £30,000.

John Jenkins, Ltd., builders, contractors, &c., 12, Clifton Road, Newport, Mon. Capital: £5,000.

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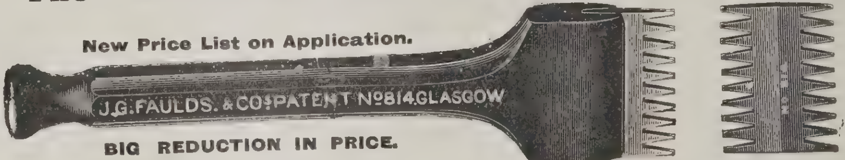
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THE

BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

June 21, 1905. Vol. 21, No. 541. 6, Great New Street, Fetter Lane, E.C.

Summary.

Sir Aston Webb was presented with the Royal Gold Medal on Monday evening at the Institute. (Page 345.)

The cornice on the new Gaiety Hotel is the largest in London. The chief rooms of the building are the restaurant, the ballroom, the Adam banqueting hall, the masonic temple and the two buffets, one on the Strand, the other on Aldwych. The main kitchens are in the basement, but there is also a kitchen on the top floor. (Page 341.)

MM. Coquelin and Binet propose "a theatre for the people" in Paris without corridors and passages. The auditorium would communicate through a single vast quadrangle with the street. (Page 346.)

The Waldorf Theatre on Aldwych is the last to be built in London under present regulations with three tiers. It is also the second theatre in London—"His Majesty's" being the first—to have a stage with no rake. There is, on the other hand, a very steep rake in the stalls—as much as 5ft. in twenty rows. (Page 340.)

Controversy about the new flying buttresses to York Minster continues. Mr. Bodley's point is that the roof is pushing out the clearstory walls, and critics neither disprove the existence of this outward thrust nor do they suggest how it is to be met. (Page 347.)

The special drawing which has been prepared clearly shows how the proposed new Royal Infirmary at Glasgow will overshadow the cathedral. A protest is being made against the proposal, on two grounds—that the existing building by Robert Adam will be needlessly demolished, and that the site is not suitable. (Page 346.)

Mr. James Mansergh, the well-known engineer, died last week, aged 71. (Page 348.)

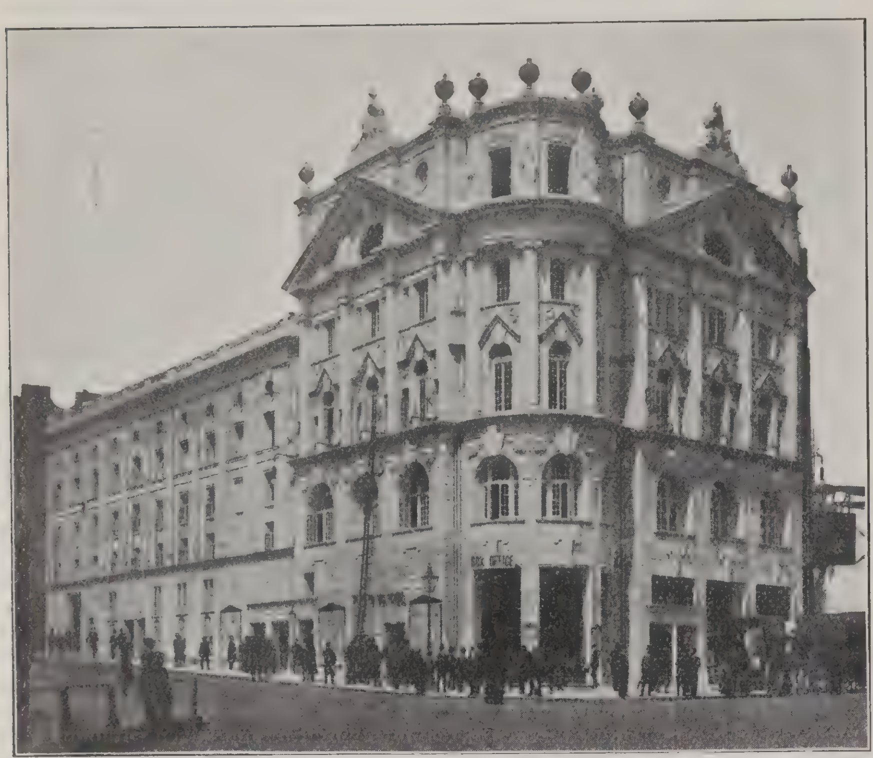
A correspondent adversely criticizes the first-premiated design for Primitive Methodist orphan homes at Harrogate, which he considers is badly planned. (Page 347.)

Mr. W. E. Riley, superintending architect to the London County Council, stated recently before the Select Committee of the House of Commons which is considering the Building Acts Amendment Bill that the Council desired the prevention clauses to be dealt with without delay, but other amendments would be deferred till next session. (Page 352.)

Irregularities in mediæval buildings, such as side walls neither parallel nor straight, pillars unequally spaced, &c., are not due to indifference on the part of the builders but (it is contended) perspective illusions and refinements, similar to those in Greek temples first made known by Mr. Pennethorne and Mr. Penrose about the middle of last century. (Page 349.)

A Carpentry and Joinery Exhibition. An exhibition of works in wood and woodcarving was opened on Monday at the Carpenters' Hall, London Wall, E.C., which is of the greatest interest to all connected with the building trade. It is the sixth exhibition held under the auspices of the Worshipful Company of Carpenters and the Worshipful Company of Joiners, and it will remain open until Saturday, July 1st, from 11.30 a.m. to 9.30 p.m. (Saturdays 6 p.m.). The exhibition is a considerable improvement on those of previous years, and it is apparent that these two City Companies are doing much good to the crafts which they were originally founded to support. In this they are different to some of the other City Companies, who do almost nothing but eat. A number of prizes are offered by the two abovenamed Companies to artificers and others for models made with their own hands, and this year it is noticeable that exhibits come from all parts of the country, not being confined mostly to London, as in former years. In the Constructive Carpentry division models are shown of all ordinary work; there are six classes into which the models are divided—(1) a queen-post trussed roof of 35ft. span; (2) a hammer-beam roof of 50ft. span; (3) bridge centering for a trussed bridge of 40ft. span for temporary railway traffic, and framed centering for bridges, railway arches, squint arches, niches and concrete domes; (4) shoring and needling to a London terrace house five storeys in height and 30ft. frontage, the ground-floor of which is to be converted into a shop; (5) gantries or staging for carrying a derrick or steam crane; (6) framed trustle for elevated railroad 30ft. high. The competitive conditions for this division were that the greatest amount of strength at the smallest expense of labour and material should be the object; yet it is noticeable in almost every case that the common fault of models, of not realizing scale, is apparent. It is doubtful if models are of much instructive value in reference to carpentry. Practical knowledge can only be gained by executing work full size. These models show generally that the craftsmen have failed to appreciate the primary condition of carpentry—that the timbers shall not be of extravagant size and that they shall be weakened as little as possible by cutting away. It is noticeable in a number of these models that the bearing timbers are cut away, whereas the subsidiary members are not cut. For instance in model No. 2, Class I., the purlin is notched instead of the common rafter, and in No. 5 the principal is notched, whereas it would have been better to notch the purlin, for the tendency is for a truss to heel over: and any slipping of the purlin could be met by nailing a cleat under it. The models for hammer-beam roofs are, on the whole, commendable. The first prize is awarded to a design which is thoroughly praiseworthy. It is very cleanly done and direct bearings are given without recourse to wedging. The same faults of want of appreciation of scale and practical conditions are apparent in the models in Division II. in framed timber for verandahs, cricket pavilions, temporary stands, domes, cupolas, steeples, groining and small framed houses; and likewise in Division III., which deals with staircases, window frames, sashes and casements, &c. Division IV. is devoted to furniture, and Divisions V., VI. and VIII. to woodcarving. The latter include a number of exhibits that show proper appreciation of the material and are of artistic design, but many of the exhibits are rough. However, the exhibition as a whole is deserving of attention by architects and craftsmen, the models showing much thought and often suggesting improvements on traditional methods.

Wesleyan Church House Competition. One of the most important recent competitions has been that for the new hall and connexional offices which are to be built for the Wesleyan Methodists on the site of the Westminster Aquarium. As already announced in our columns, the successful architects are Messrs. Lanchester & Rickards, some particulars of whose design were given on page 338 of our issue for last week. In the present issue we are able to publish the perspective, elevations, sections and plans of the selected design, which will be studied with great interest. We are also able to give two of the other designs (eight in all) submitted. It will be generally admitted that the selected design groups well together and is very compact in plan. It is a question, however, whether the large dome is not rather too flat, and the cutting of it by the balustrade at the base of the lantern only increases this appearance of flatness. The total height of the dome will be 170ft. and the twin towers 140ft. In the interior, of course, the chief feature is the great hall, which is on the first floor, and will seat 1,401 people on the floor and 1,154 in the galleries—2,555 in all. The details of the accommodation are best seen by examining the plans.



THE WALDORF THEATRE, ALDWYCH, LONDON. W. G. R. SPRAGUE, ARCHITECT.

TWO NEW BUILDINGS ON ALDWYCH.

WE illustrate in this issue the new Waldorf Theatre and the Gaiety Hotel, facing each other across Aldwych, the crescent thoroughfare at the bottom end of the new street from Holborn to the Strand.

The erection of the Waldorf Theatre has already been recorded in our pages by a special series of photographs (see the issue for April 5th last), and in presenting the accompanying views of the interior we complete our record of the building.

The Waldorf Theatre has been built from the designs of Mr. W. G. R. Sprague by the building department of Messrs. Waring & Gillow, Ltd., who also have carried out the decorations and were responsible for the stage construction and mechanism. The theatre has a frontage of about 70ft. to Aldwych and a return elevation of 166ft. to Catherine Street; it commands a view of the Strand, and has a Classic elevation in white Portland stone, surmounted by vases and allegorical groups.

Entering from the corner of Aldwych into a marble vestibule (see p. 345), and thence up a short flight of marble steps, one proceeds to the grand crush-room. The dress circle is reached by a marble staircase terminating in a semicircular foyer, from which the tier is entered. From this foyer the staircase continues up to the grand saloon. The auditorium is capable of holding upwards of 1,790 persons, the dimensions from curtain line to the back of the auditorium being 69ft., between the side walls 50ft., and the proscenium opening 31ft. by 29ft.

This is the last theatre to be built in London under present regulations with three tiers. It is also the second theatre in London —" His Majesty's" being the first—to have a stage with no rake. There is, on the other hand, a very steep rake in the stalls, as much as 5ft. in twenty rows. As the stage is not more than 39ft. deep, it will not be suitable for very elaborate spectacular productions.

The theatre has four private boxes, the whole of the area being occupied by stalls, the dress circle on the first tier, balcony on the second, and amphitheatre and gallery on the third. Ample refreshment accommodation is provided for all parts of the house.

The decorative scheme of the interior is a bold and broad treatment of the Louis XIV. style, the characteristic richness of which is carried out without any suggestion of weakening by the employment of minute or over-elaborate ornament. The walls of the crush-room and main staircase are covered in alternate stripes of dove-coloured and *brèche violet* marble, divided with panels of the latter, after the manner adopted in many of the Genoese churches, and marble pilasters with gilt capitals; the balustrade of the staircase is a wrought-iron copy of one of Baren's famous designs. On the first-tier level is the refreshment salon, a fine example of delicate and carefully studied period work in cream and gold. In the auditorium the colour scheme is *Rose du Barry*, which is relieved by the cream and richly-gilt circle fronts and a touch of green in the French tapestries which are used for the upholstery of the stalls and dress circle; a rather more sombre and qualifying note being struck in the brown French walnut of the seat frames.

One of the notable features is a circular ceiling in modelled plaster with finely-gilt centrepiece and outer border, and a boldly treated picture sweeping round between the two, painted after the style of Le Brun and reproducing a good deal of his effect. Attention may be drawn to the *bas relievo* modelling of the tympanum which surmounts the proscenium, representing Apollo in his

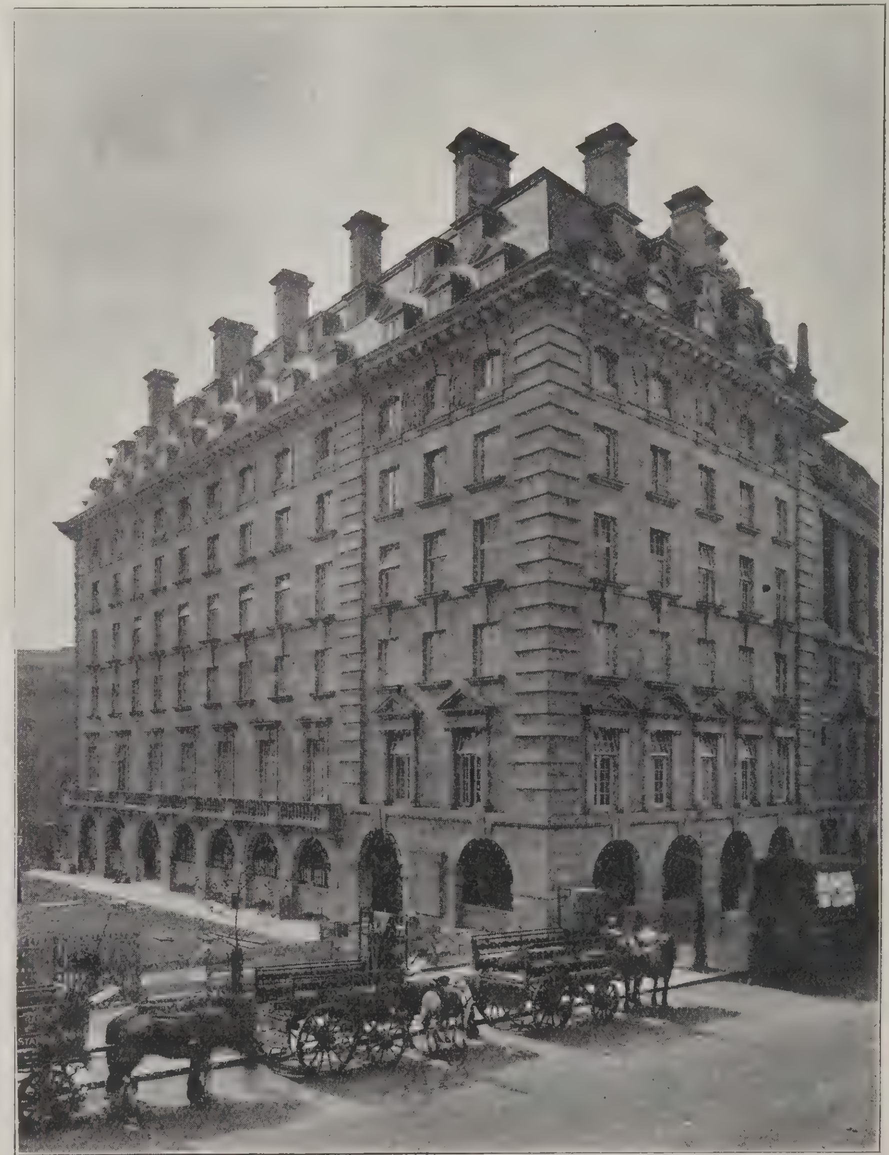
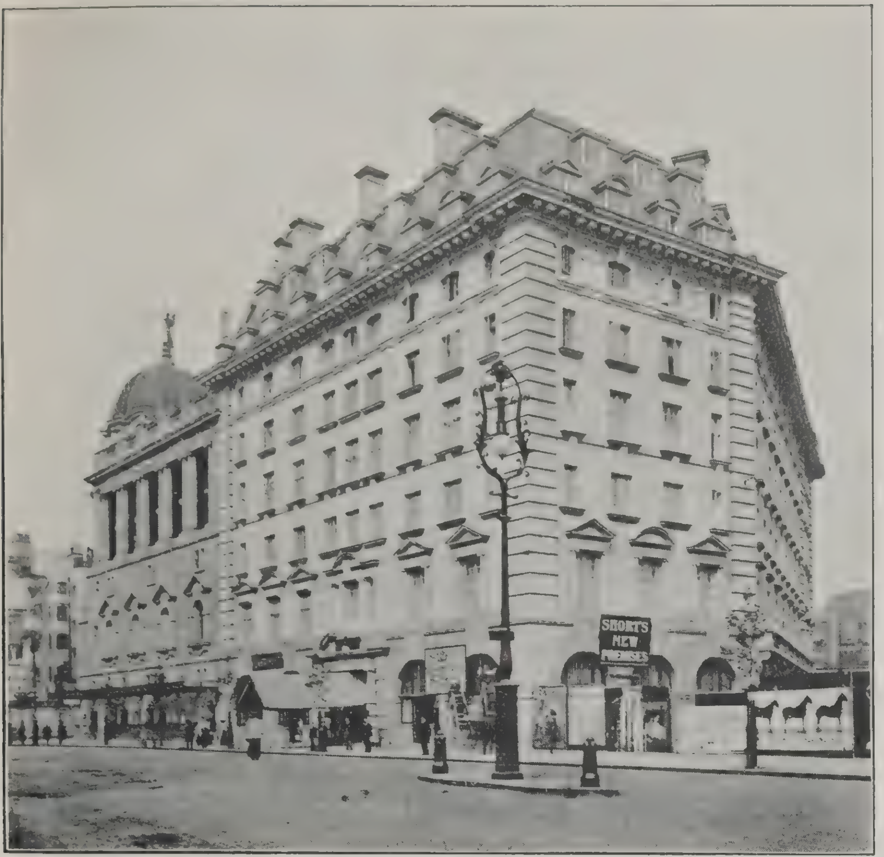


Photo: S. B. Bolas & Co., 68, Oxford Street, W.

THE GAIETY HOTEL, FROM ALDWYCH. ERNEST RUNTZ AND FORD AND R. NORMAN SHAW, R.A., ARCHITECTS.



GAIETY HOTEL: STRAND FRONT.

chariot drawn by four spirited horses, attended by goddesses, cupids, &c. A deep cornice in the Louis XIV. style runs round the theatre and constitutes a feature, giving an unusual but rather welcome rigidity of line over the proscenium opening and the boxes. The proscenium opening and the dress and upper circles are supported with pilasters of *fleur de pèche* marble with gilt capitals; and between the smaller pilasters on the dress circle and stall levels the novel treatment of lofty mirrors reaching to the cornice has been adopted. The general character of the interior is one of rich and bold beauty, with the Louis XIV. feeling scrupulously maintained.

The heating, hot-water supply, ventilating arrangements, fire hydrants and fireproof curtain have all been carried out by Messrs. Strode & Co., of 48, Osnaburgh Street, Regent's Park, N.W.

The heating is on the low-pressure hot-water system, radiators being fixed in various parts of the auditorium and corridors in recesses formed to prevent the radiators projecting beyond the face of the walls. A separate boiler is provided for the hot-water supply to all the lavatories, and also for warming the dressing-rooms.

Eleven of Strode's special hydrant valves are fixed in various parts of the building, these also being recessed into the walls so as not to cause obstruction in the corridors, &c. With each valve is supplied a 60ft. length of hose and hose-fitting, all mounted on polished boards recessed into walls ready for immediate use. Twenty-seven fire buckets filled with water are also available in various parts of the building, and on the stage is provided various firemen's equipment.

The fireproof curtain is constructed to the London County Council's latest requirements and rules, which have become far more stringent since the disastrous fire at Chicago, the asbestos cloth being severely tested before being passed. The curtain is covered with this cloth on both sides, and lined between with silicate cotton packed about 2ins. thick throughout, about 2 tons of this silicate cotton being used altogether.

The curtain can be instantaneously released either from the stage itself or from the stage exit, and will fall in 15 seconds, entirely cutting off the stage from the auditorium. Messrs. Strode & Co. have a special concussion tube which enables the curtain to fall silently and without jar or shock to the stage. At the same time that the curtain is released a water sprinkler is opened which throws a sheet of water from ceiling to stage. The curtain is raised by a winch in the flies.

The steel construction for the theatre was executed by Messrs. Smith Walker & Co., and the electric lighting by Messrs. Blackburn, Starling & Co., Ltd., of Hanley.

The Gaiety Hotel.

The Gaiety Restaurant and Hotel forms the eastern half of the block on the famous Strand "island," with "Short's" wine-house at one corner on the ground floor. The Gaiety Theatre, at the opposite end, was opened in October, 1903. In the design of the whole building the Florentine period of the Italian Renaissance was adopted on the suggestion of Mr. Norman Shaw, R.A., who has been associated with Messrs. Ernest Runtz & Ford, the architects. The bold masses simply fenestrated, and surmounted by the interesting carved frieze by Mr. Hibbert Binney, cannot fail to arrest the attention of passers-by. The whole of the façades are executed in Portland stone. The cornice, fixed at a height of 80ft., is the largest in London. Above it is a two-storey mansard roof of steel and concrete.

The main entrance from the Strand leads to a hall 57ft. by 21ft., panelled in mahogany, with a modelled frieze ivoried over, the

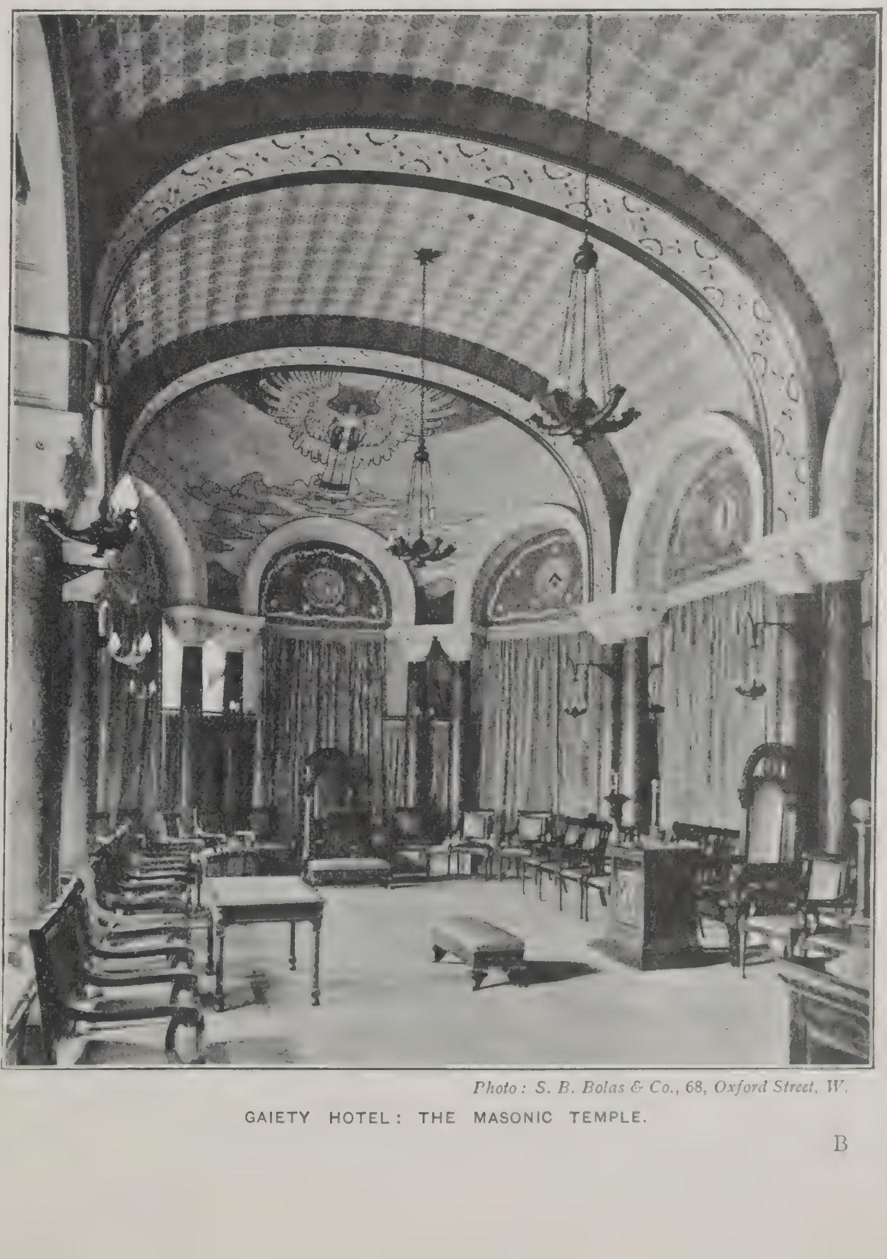


Photo: S. B. Bolas & Co., 68, Oxford Street, W.

GAIETY HOTEL: THE MASONIC TEMPLE.

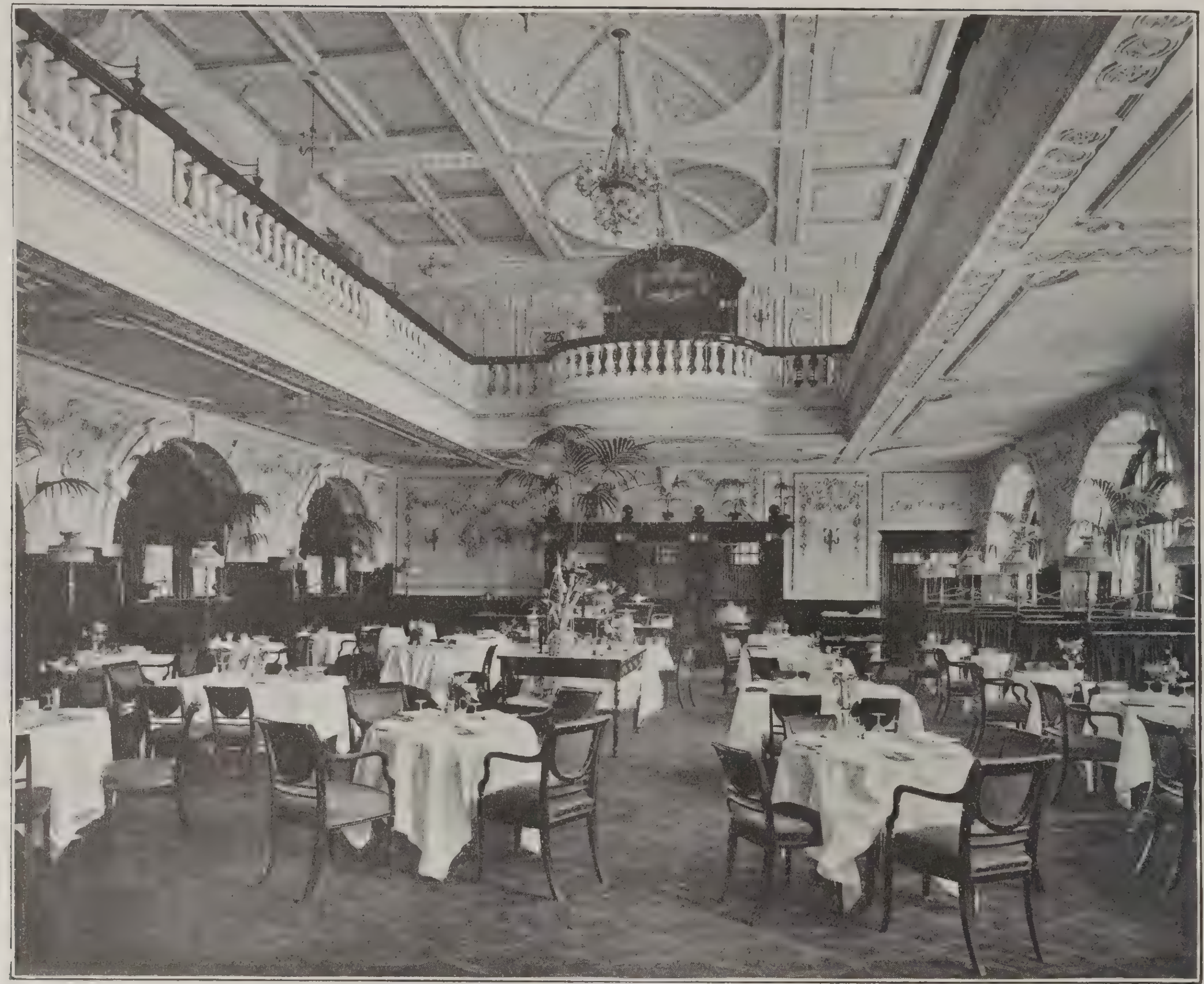


Photo: S. B. Bolas & Co., 68, Oxford Street, W.

THE GAIETY RESTAURANT. ERNEST RUNTZ AND FORD, ARCHITECTS.

ceiling also being richly modelled. On the left is the grand staircase, with a stained-glass window on the half-landing (by Messrs. E. J. Prest & Co., of Haverstock Hill). At the further end of the main entrance hall is the restaurant, 60ft. by 40ft., with balcony around. It is lighted by semicircular headed windows on the ground floor and on the balcony level by French casements. The walls are panelled in white and the doorways carried out in mahogany. The carpet and hangings are red. The popular tip-up Gaiety stall seats are again in evidence, as also the alcove treatment around the walls, thus affording facilities for a degree of privacy somewhat unique in the restaurant world. On the balcony level, at the northern end, is a space for the orchestra, and on the south a spacious lounge, from which numerous public and private rooms are approached.

Above the restaurant is the ball-room, decorated in heliotrope, white and yellow, and similarly treated with a balcony around. The floor is of oak, on springs.

To the left of the main entrance on the Strand is a large buffet, 36ft. by 26ft., decorated in the Georgian style, with polished mahogany moulded, panelled and carved wainscot, and decorative plaster panels above with swags of fruit and flowers. Also on the ground floor, but on the Aldwych front, is another buffet, based on a Dutch model. This is 44ft. by 22ft., and panelled throughout in bass wood stained green, with Dutch tiles and ornamental pewter-work between the frames.

On the mezzanine floor is the Adam banqueting hall. This is 45ft. long and 30ft. wide, carried out entirely in the style of the period which gives its title. The colour scheme here is white and green. Adjoining, on the Strand front, are three private dining-rooms, named respectively after Nelly Farren, Kate Vaughan and Fred Leslie.

On the first floor is the masonic temple and banqueting hall, with the tiler's room between. The masonic temple is based on Byzantine work and has been decorated by Mr. Neatby. It is 45ft in length, 27ft. in height and 26ft. in width, with an apsidal end and barrel roof over, supported on sixteen Sienna scagliola marble columns, hung with curtains between. The semi-dome and the semicircular end above the organ are decorated with emblematical paintings, the angel figures representing "The Star of the East," The Spirit of the West," The Spirit of the South," and, as background, a starry sky and the Tree of Life bearing bursting pomegranates. The prevailing colour scheme is a rich blue, with pearl velvet in the draperies. The banqueting hall adjoining the tiler's room is 34ft. long, 31ft. wide and 27ft. high. This is carried out entirely in Greek detail, the colour scheme being terra-cotta, red and white.

On the second floor are three private dining-rooms and two suites; and on the third, fourth and fifth floors numerous suites of residential chambers, each self-contained: these consist of entrance hall or lobby, bedroom, sitting-room, bathroom and lavatory. The decorations are varied, being in the Dutch, Queen Anne, Adam, Art Nouveau and Louis XVI. styles.

On the sixth floor are kitchen, staff dormitories and various offices. The main kitchen is in the basement, where also is the grill or joint room, 60ft. long, 40ft. wide and 17ft. high, panelled in white enamelled wood, with a green and gold frieze over, carpeted and upholstered in a green tint, and fitted with tip-up seats.

The furnishing and decorations of the hotel and the electrical fittings have been carried out by Messrs. J. Shoolbred & Co., Ltd., and the steelwork by Messrs. Matthew T. Shaw & Co., Ltd., of 81, Cannon Street, E.C., who had some unusual difficulties to face by reason of the requirements of shallow floors showing no beams; in such cases the engineers designed special forms of framed trussed girders extending in depth through three floors. The consulting engineers were Messrs. Barry & Higham, of 15, Great George Street, S.W.

Electric Lighting.

The electric-light installation consists approximately of 3,000 lamps. Five main circuits have been brought into the building, four of which are provided with change-over switches, connected to the ordinary network and theatre mains of the Charing Cross and City Electric Supply Co., Ltd., while the fifth circuit is connected to the mains of the Metropolitan Electric Supply Co., and supplies about 300 lamps in the public portions of the building, as well as the "police lighting" as required under the L.C.C. regulations. The whole of the wiring is in heavy steel conduit, and all fuses are of the enclosed cartridge type. One of the features of the installation is the use of the new type Hart "Diamond" switches and flush plugs. These are let into the wall flush with the paper.

In addition to the lighting, services have been run throughout for the numerous motors to electric lifts and ventilating fans. An electric heating service has also been provided, for keeping dishes hot, heating coffee, tea, &c., this equipment being by the Reliable Electric Heating and Cooking Co.

Fire Alarms.

On each floor of the hotel are there fire-alarm pushes, communicating with a loud

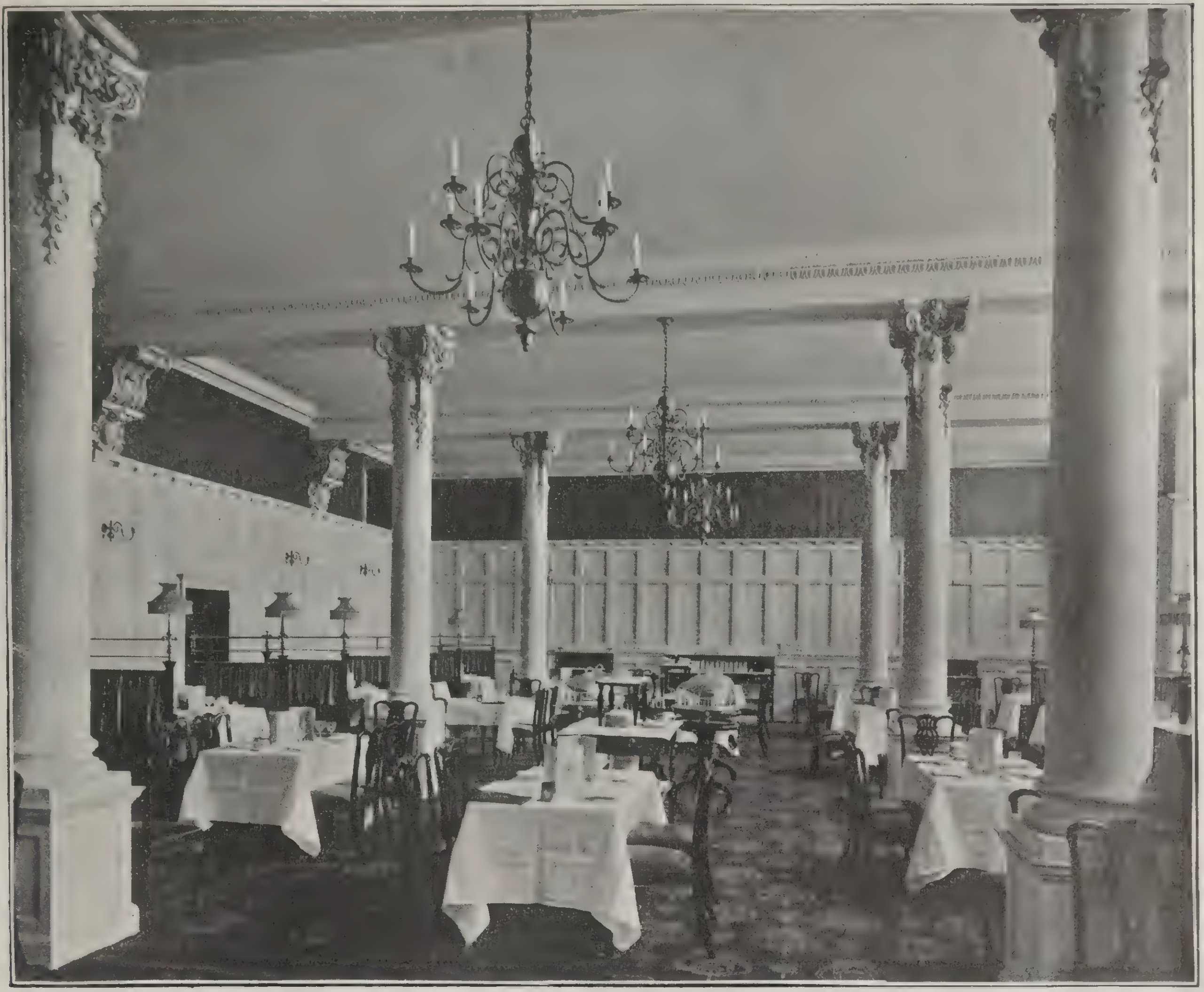


Photo: S. B. Bolas & Co., 68, Oxford Street, W.

JOINT ROOM GAIETY HOTEL. ERNEST RUNTZ AND FORD, ARCHITECTS.

gong in each service room on every floor and in the manager's office, and at the same time indicating which floor the alarm came from, so that men specially drilled can proceed immediately to the point of outbreak. All these alarms are lighted at night by a small red lamp, so that their position is at once evident. Telephones are provided throughout the building.

Ventilation.

The ventilation is on two separate schemes, *i.e.*, plenum and extraction. For the former, air is drawn through a revolving filter screen, by which it is purified and humidified, being afterwards cooled or warmed according to the season of the year. The extraction system consists of two fans near roof level. One of these is connected with the kitchen by a series of large ducts and hoods, and the other is connected to the various rooms. The whole of this work—electric lighting, heating, ventilation, telephones and fire-alarms—has been carried out by Messrs. Shoolbred to the specification of the consulting engineer, Mr. Adrian Collins, A.M.I.C.E.

Fire Hydrants

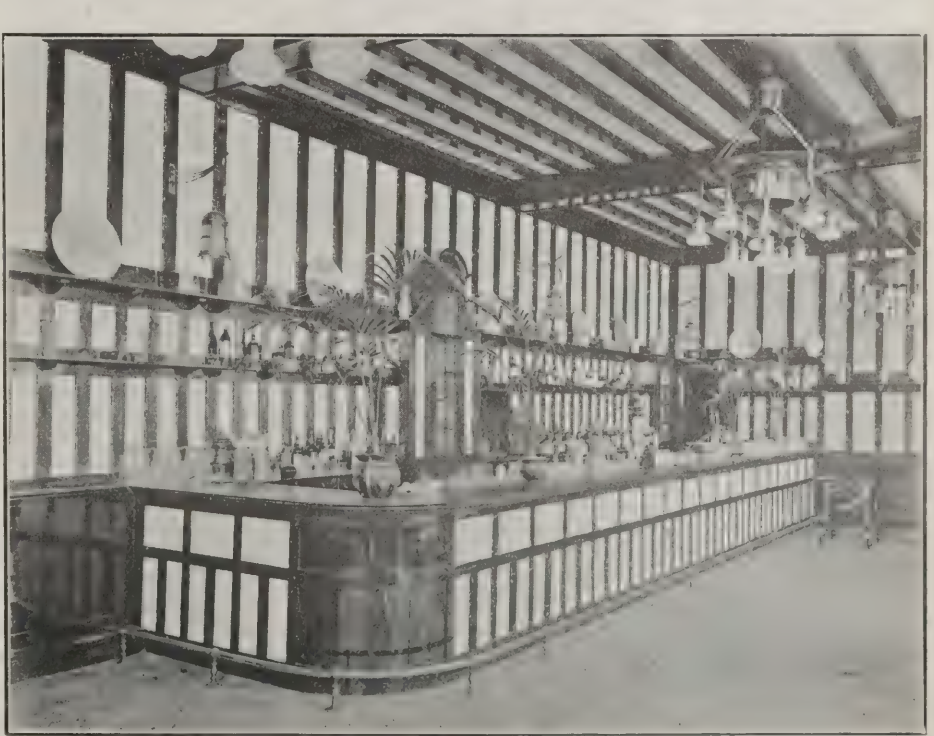
have been installed by Messrs. Strode & Co., of 48, Osnaburgh Street, N.W., two hydrant mains with valves being fitted on each floor (twenty-seven in all). Hose pipe and nozzles are attached to the valves ready for immediate use. Messrs. Strode have also provided and fixed the two large steam-boilers for heating, cooking and hot-water supply. The ventilation of the boiler-room is effected through a shaft 3ft. wide and 60ft. long, fitted with an electric blower.

The heating apparatus for the building is on the low-pressure steam system, with automatic regulators.

The engineering work has been carried out by Messrs. Rosser & Russell, Ltd., of 22, Charing Cross.

In the kitchens are fittings by Messrs. James Slater & Co., of High Holborn; the "Central" stores and hot closets having been supplied by Mr. A. Ceresa, of 12, Westminster Bridge Road.

Refrigerating plant has been installed by Messrs. L. Lumley & Co., Ltd., of 1, America Square, E.C., the cold room being insulated with silicate cotton, the walls and ceiling



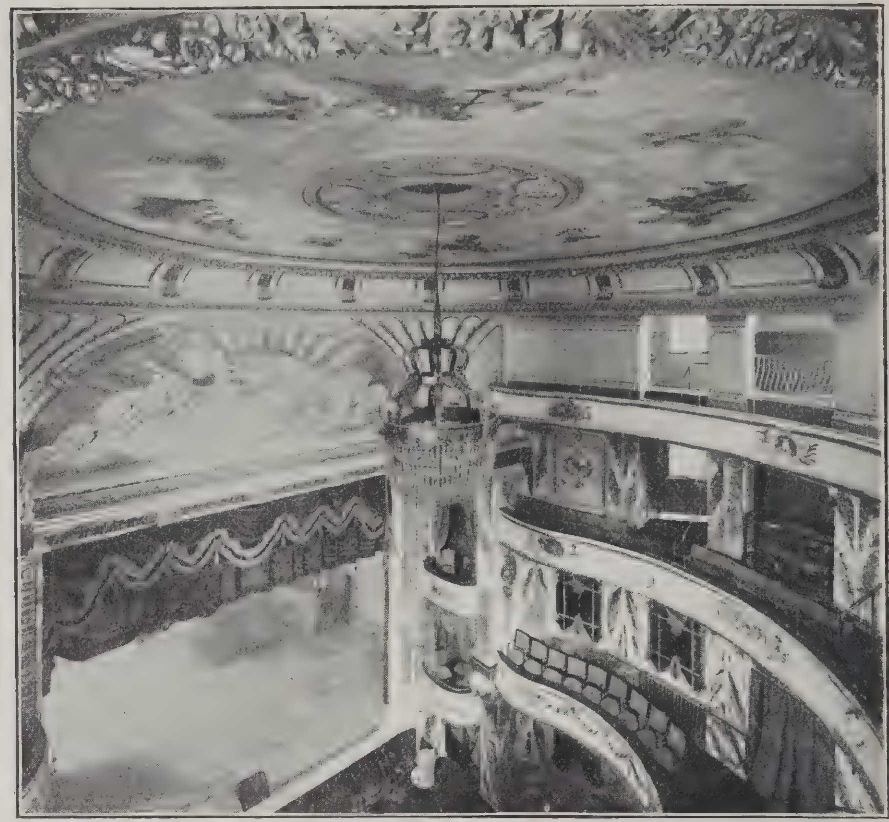
GAIETY HOTEL: THE DUTCH BUFFET.

being finished with white enamel and the floor asphalted. The room is cooled by a large stack of iron pipes, through which cold brine is pumped continuously. Double-doors, forming an air-lock, prevent the admission of warm air. The larders are also thoroughly insulated, the walls being covered with white enamelled metal and fitted with plate-glass sliding doors. By these means quantities of meat, poultry, game, &c., can be kept in a perfectly fresh condition however sultry the weather may be.

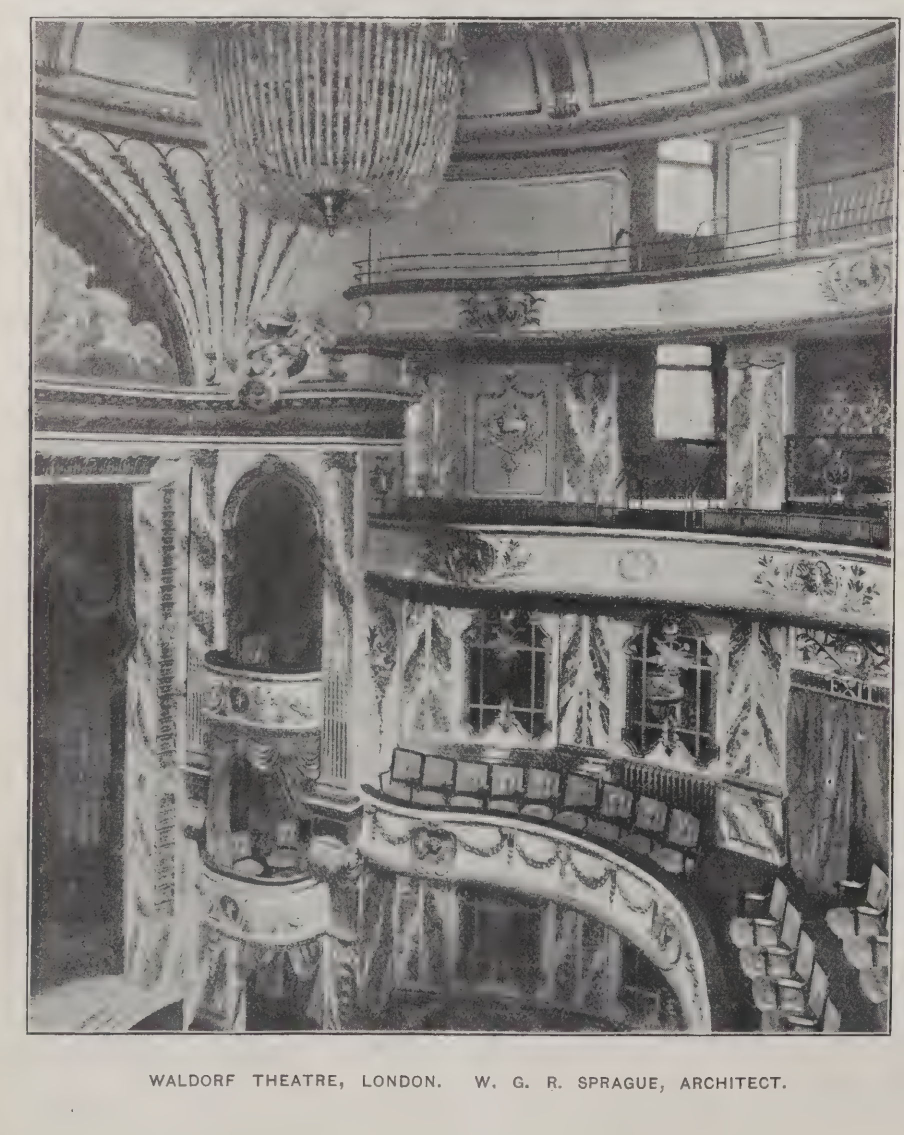
The Electric Lift Service has been provided and fixed by Messrs. R. Waygood & Co., Ltd. There are two passenger lifts—a large one in the main entrance hall to carry seven passengers and attendant (the cage of this lift is of mahogany and was designed by the architects), and one of a plainer type in the staircase at the back entrance, to carry four persons and attendant. There is also a goods lift running from the basement to the sixth floor, as well as electric service lifts, some arranged to work from the top kitchen and others from the kitchen in the basement: these lifts are fitted with special automatic push-button control, so that they can be dispatched from the kitchen to any floor and there stopped automatically, being afterwards caused to return when finished with. Hand-power lifts—including a large one for lowering barrels into the cellar—are also provided.

The sanitary appliances, baths, &c., are of the most approved and modern type, by Messrs. Doulton & Co., Ltd., and Messrs. J. Tylor & Co., Ltd., of London.

The contractor for the building was Mr. James Carmichael, of Wandsworth, the contractor's foreman Mr. Mackintosh, and the clerk of works Mr. Lett.



WALDORF THEATRE.



WALDORF THEATRE, LONDON. W. G. R. SPRAGUE, ARCHITECT.

OUR PLATES.

THE medical school and nurses' home of University College Hospital is the outcome of the generous gift made last year by Sir Donald Currie. The Gower Street end of the building and most of the University Street frontage will be occupied by the school proper, which will consist of large laboratories, theatres, &c. The Huntley Street end is devoted to the nurses' home, in which there will be accommodation for seventy-four nurses. Between the school and the nurses' home there is a house for eight students engaged in obstetric work. The principal elevations are intended to be in Portland stone and red brick. Mr. Paul Waterhouse is the architect.

The staircase hall at the house on Shillingford Hill, Berks, was carried out by the builders, Messrs. Brasher & Son, of Wallingford. The panelling is in wainscot oak, the walls above it and the cornice and ceiling being in plaster. The chimney-piece, which was designed by the architect, Mr. George Hornblower, was executed and carved by Messrs. Shuffrey & Co., in wainscot oak, with marble surround to the fireplace opening.

Law Cases.

Dunfermline Landscape Garden.—In the Scottish Court of Session recently Lord Dundas ordered proof in the action by Mr. T. H. Mawson, garden architect, Windermere, against the Dunfermline Carnegie Trustees. Mr. Mawson claims £3,101 for professional services in connection with his preparation of a scheme for laying-out Pittencrieff Park and Glen. The defence is that plaintiff was employed to scheme a landscape garden, and that he exceeded his instructions by preparing a scheme which included the construction of tramways and boulevards and the re-housing of a large proportion of the population of the town. His own estimate of the cost of this scheme was £110,437.

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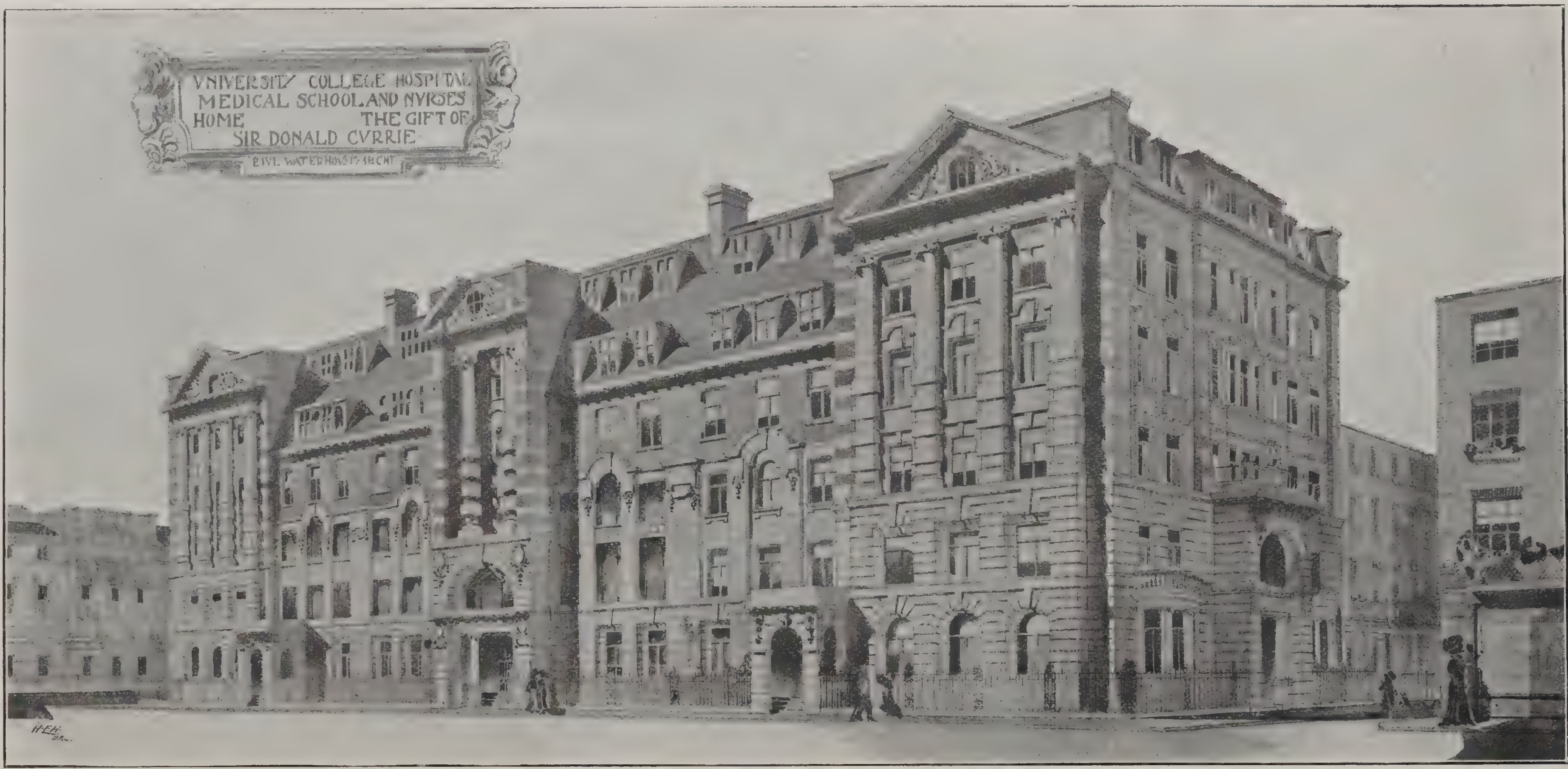
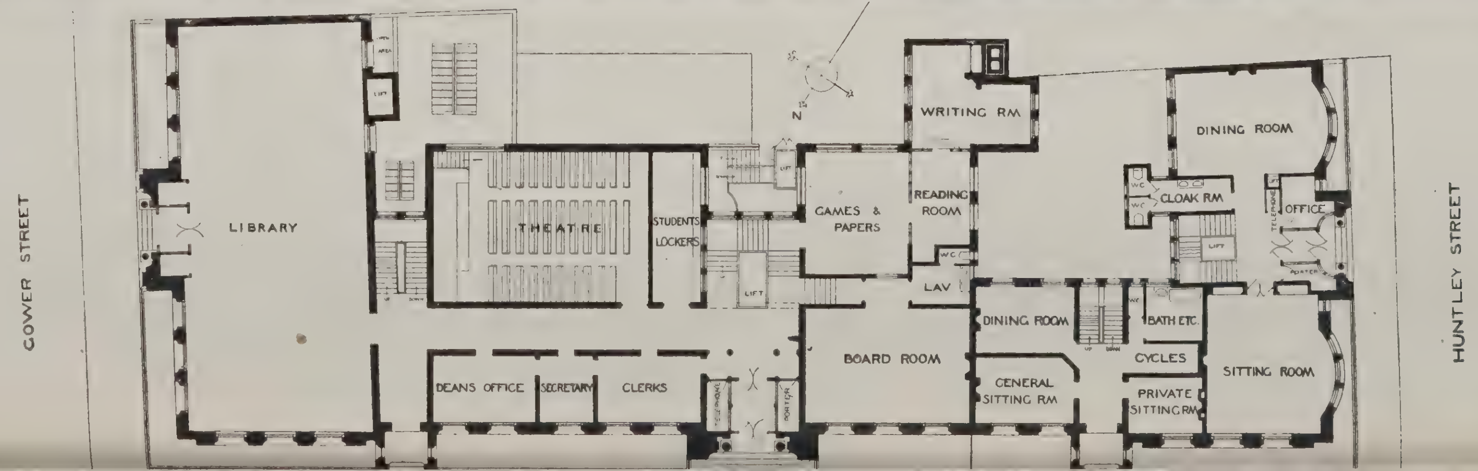
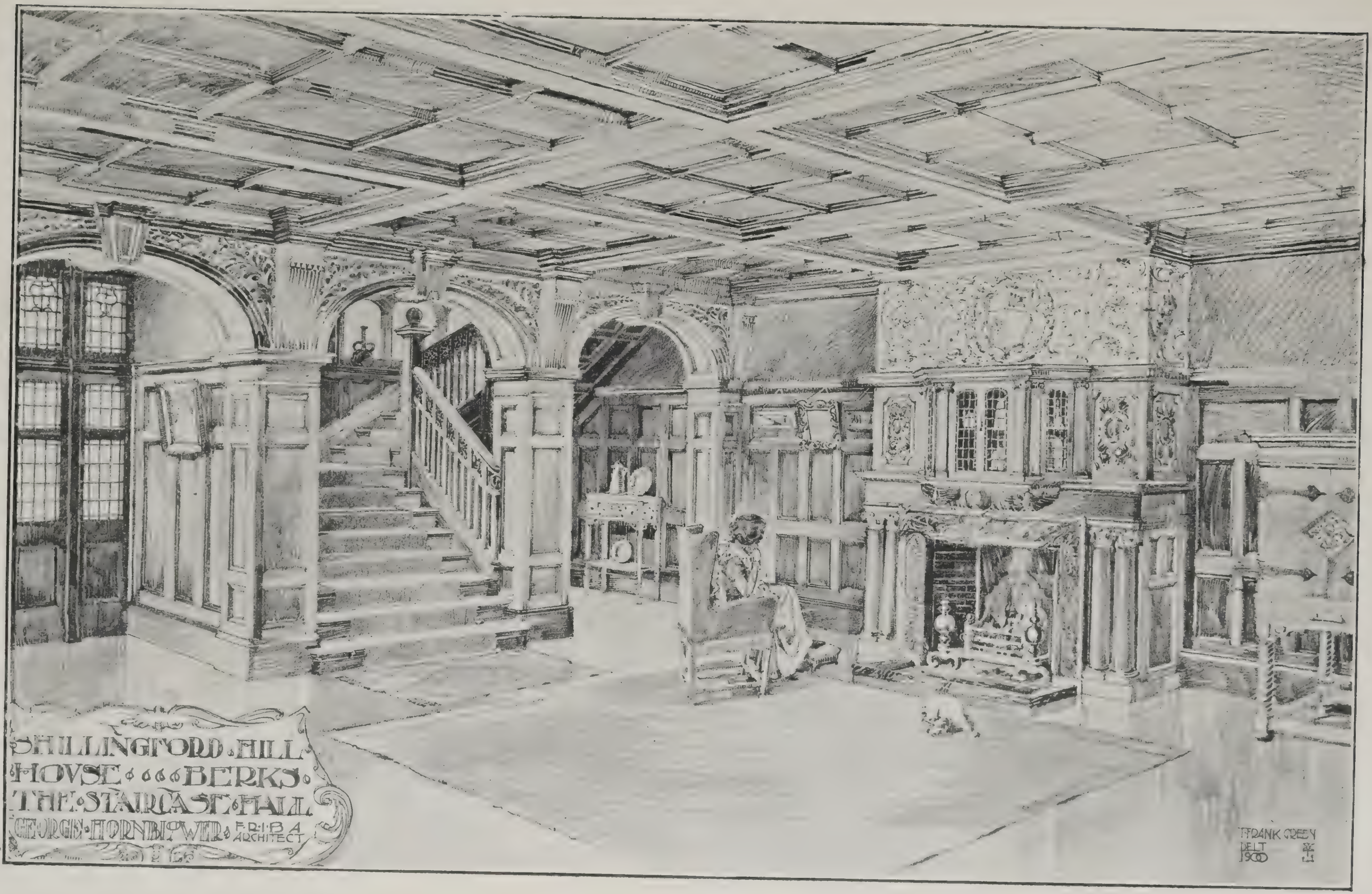
Supplement to
The Builders' Journal and Architectural Record,
Wednesday, June 21st, 1905.





UNIVERSITY STREET



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R.I.B.A.

Presentation of the Royal Gold Medal.

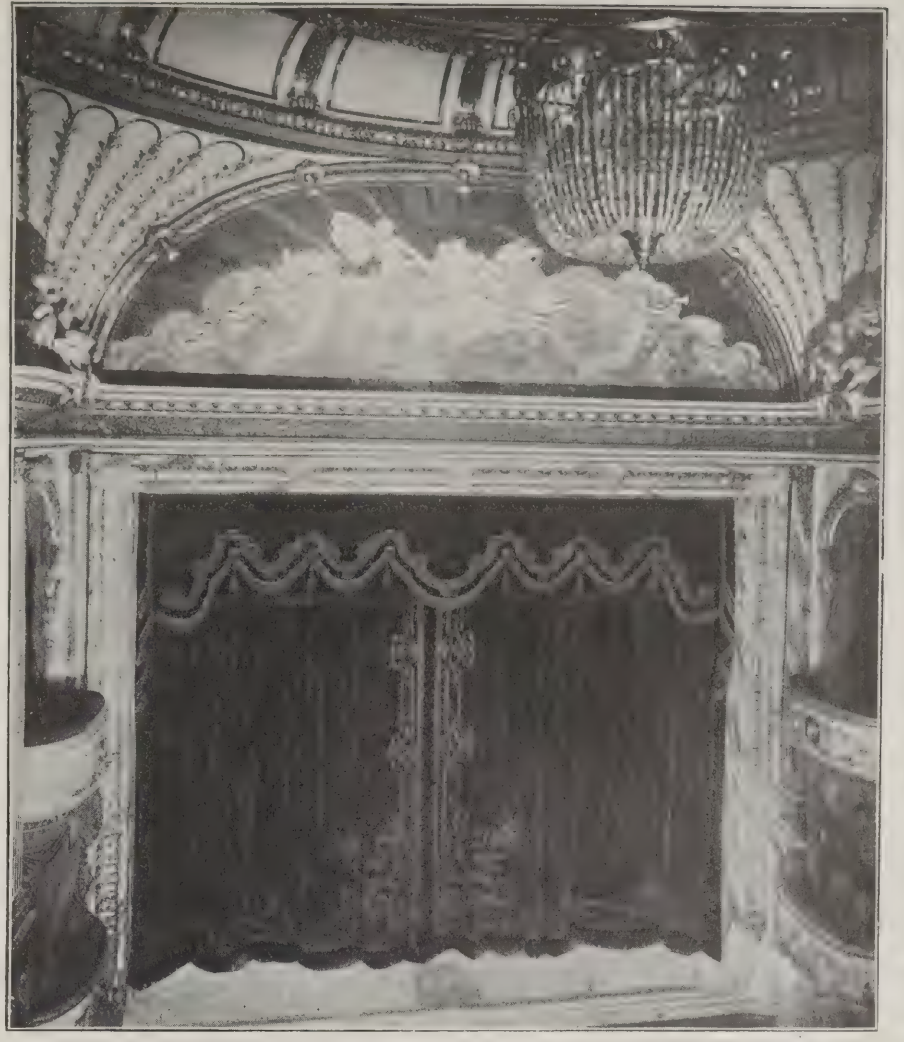
THE concluding meeting of the session of the Royal Institute of British Architects was held at 9, Conduit Street, W., on Monday evening, the president, Mr. John Belcher, A.R.A., in the chair. The chief object of the meeting was the presentation of the Royal Gold Medal to Sir Aston Webb, R.A.

Mr. Belcher remarked of Sir Aston Webb that the very year after he was articled to Mr. Banks (of Banks & Barry) – that is, some thirty eight years ago—he became a member of the Architectural Association, and from that time onward continued to serve the Association in one capacity or another, until finally in 1884 he was elected its president.

In 1874—that is, the year after he won the Pugin Studentship—he joined the Institute as an Associate, was elected a Fellow in 1883, served as member of Council, hon. secretary, and vice-president, and finally became president in 1902.

"His peculiar distinction—and I might say peculiar good fortune, too—lies in the large number of important public buildings that have been entrusted to him. Many of these have been won by sheer weight of merit shown in competition. Amongst such are to be included the Victoria Courts at Birmingham, the Metropolitan Life Assurance Society's offices in Moorgate Street, and the Christ's Hospital Schools at Horsham, all carried out in partnership with Mr. Ingress Bell.

"Our present interest, however, centres in the great works committed to him in London, viz., the completion of the Victoria and Albert Museum and the National Monument to Queen Victoria, both of them won in competition; also the Royal College of Science opposite the Imperial Institute, and additions to the Admiralty Buildings at the east end of the Mall, both of which he received by direct commission.



WALDORF THEATRE: THE PROSCENIUM.

"The Admiralty entrusted to him the Britannia Royal Naval College at Dartmouth. In conjunction with Mr. T. M. Deane, he built the College of Science Government Offices in Dublin. He and Mr. Bell together are responsible for the Royal United Service Institution adjoining the Banqueting House, Whitehall, the new University of Birmingham now in course of erection, and for certain additions to Caius College, Cambridge.

"Then he has done a good deal in the way of churches, both restoring and building. The most important and most interesting of all these is the restoration of St. Bartholomew-the-Great, in Smithfield, between the years 1880 and 1890. He has restored three churches in Worcester; Burford Church, Herefordshire, and Witley in Surrey. He has built St. George's, Worcester; the French Protestant Church and Schools in Soho, and churches in North Wales.

"Then there are various domestic works; mansions for Sir Offley Wakeman, near Shrewsbury; Sir Augustus Webster, at Hildon, Hants; and many others. The Flour Mills and Granaries for Messrs. Mumford are amongst his most successful buildings in this kind."

Sir Alma Tadema, R.A., and Mr. Alfred East, R.A., congratulated the recipient and spoke of the high appreciation in which he was held by his brother artists and architects.

Sir Aston Webb, in replying, acknowledged the help he had received in his work from his partner Mr. Ingress Bell, Messrs. Corderoy & Selby, his surveyors for thirty years, the builders, clerks of works, and craftsmen who had been engaged upon his works.

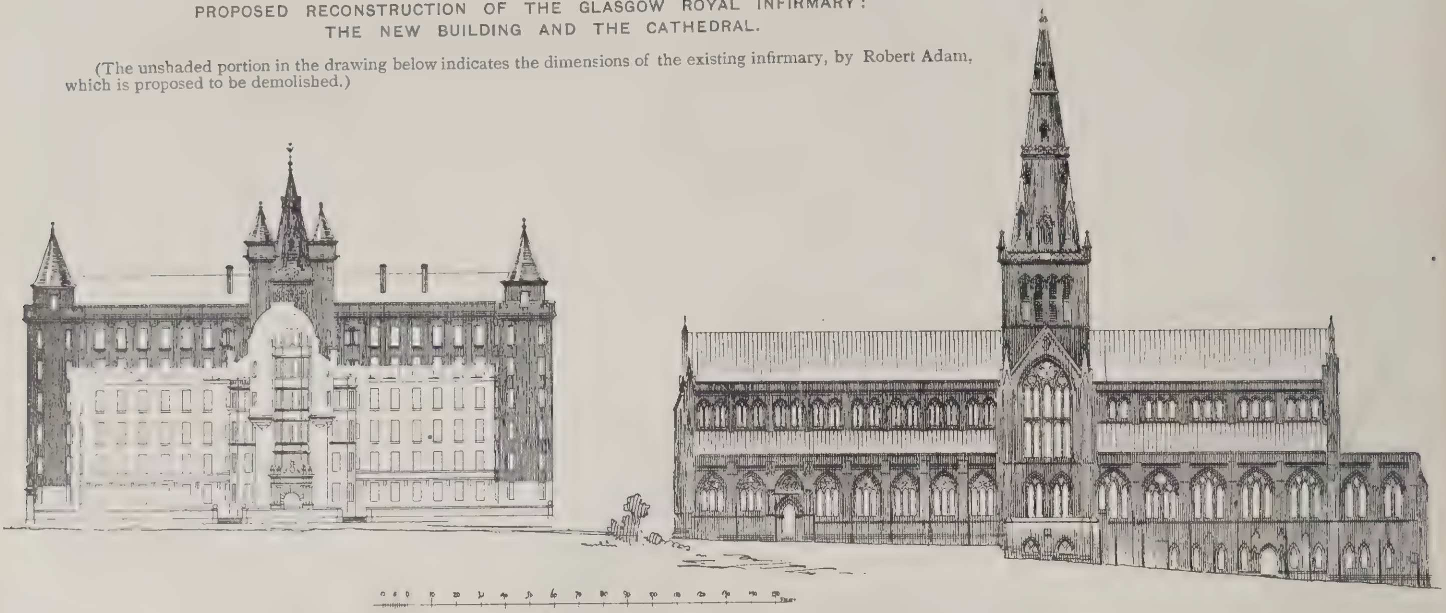
In referring to the conditions of architecture at the present time, he considered much progress had been made and much improvement—a closing up of the ranks, a desire to pick up the strain of English Renaissance where it was last left, giving it a distinct flavour of our times, making tradition our servant rather than our master, so that while we endeavoured to make our buildings as beautiful as they could, they were determined at the same time to build surely and reasonably; to make the necessities of the building develop the design, and not to be content until they had met all modern requirements with a fitting architectural exterior and interior, not ignoring what had gone before but eschewing whatever appeared to be evil and holding fast only to the good. That, he verily believed, to be the tendency of the present day. He had always been an optimist in the work of his brother architects, and was so still.

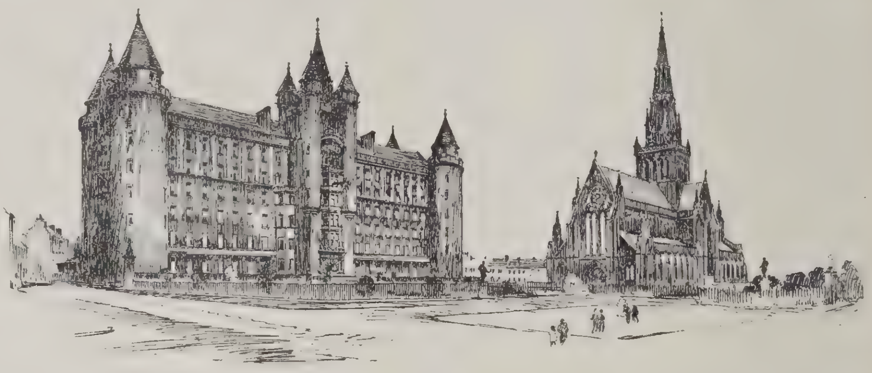
After the presentation of the medal the portrait of Sir William Emerson (by Mr. J. J. Shannon, A.R.A.) was presented to the Institute by Mr. T. E. Collcutt, F.R.I.B.A.

WALDORF THEATRE: THE ENTRANCE HALL. W. G. R. SPRAGUE, ARCHITECT.

PROPOSED RECONSTRUCTION OF THE GLASGOW ROYAL INFIRMARY:
THE NEW BUILDING AND THE CATHEDRAL.

(The unshaded portion in the drawing below indicates the dimensions of the existing infirmary, by Robert Adam, which is proposed to be demolished.)





GLASGOW ROYAL INFIRMARY.

Protest against the Proposed Reconstruction.

THE Glasgow Royal Infirmary competition has been one of the most unsatisfactory which has been held in recent years. To begin with, it is now pretty generally admitted that there should have been no competition for an infirmary on this site, which is practically in the centre of a city having a population of nearly one million. The majority of the medical profession admit that long before this building could be completed and occupied the scheme would be recognized as a hopelessly retrograde proceeding, perpetuating indefinitely a grave and costly blunder. As Dr. James Finlayson, chairman of the house committee of the infirmary, says: "That 660 sick persons should be piled up in six flats, with a dense population of the living on one hand and of the dead on the other, and with chemical and other works in the near vicinity, is a plan against which, as a physician, I must protest." The Manchester Infirmary has been frequently instanced as a precedent, but we now know that the common-sense of the citizens of Manchester has triumphed over the enthusiasm of those wedded to plans of tall buildings similar to the one adopted by the Jubilee "executive" in Glasgow.

The Jubilee Memorial block is the one which faces Cathedral Square. For it £90,000 has been received, but in order to complete the scheme a further £170,000 will be required to carry out these "discredited plans," and this money is about to be appealed for.

Readers of this Journal will remember how the award of the assessor of the competition, Sir Rowand Anderson, was set aside, and how the committee, for no apparent reason, accepted the plans of another architect not in the premiated list.

But in addition to the plea of a number that the present infirmary ought merely to be put in a state of thorough efficiency as an emergency hospital, and that a new building ought to be erected outside the city, there are the architectural objections to which the Glasgow Institute of Architects, the Art Club and the Archæological Society have drawn attention, namely, that the work of Robert Adam will be destroyed, and that in its place will be erected an immense block, which, being taller and standing on higher ground than the cathedral, will greatly injure the appearance of this very fine mediæval building.

We publish the drawings showing what is proposed, in the hope that the committee will yet see the folly of their way and in the interest of architecture and of humanity have the courage to admit their error.

Restoration of Culross Abbey.—During the operations in connection with the restoration of Culross Abbey many beautiful specimens of ancient architecture have been brought to light. In the south transept, which is believed to date from the early part of the thirteenth century, a tomb has been discovered under the arch in the aisle which is thought to be that of Roger de Quency, Earl of Winchester, who died in 1264. In the north transept the Argyll tomb has been discovered, but will not be further interfered with except in the presence of experts.

A Paris Theatre.—In the architectural department of the Exhibition of French Artists—the old Salon—in the Grand Palais, Paris, plans are shown of two projects for providing "a theatre of the people." The one, by MM. Coquelin and Binet, is that of a modern fire-resisting building without corridors and passages, the auditorium communicating through a single vast quadrangle directly with the street; from the inner end of this quadrangle thirteen flights of steps lead to the different sections of the auditorium—orchestra stalls, dress circles, amphitheatre and galleries. Seating is provided for 3,000. The second plan is for constructing an open-air amphitheatre on the site of the former palace of the Tuileries, but as yet it is little more than a suggestion favoured by a small group of architects, artists and musicians.

A new Assembly Hall at Exeter, for the Devon County Council, has been erected at a cost of about £8,000. The architects were Messrs. Harbottle & Sons, of Exeter, and the contractors Messrs. Dart & Francis, of Crediton. The heating and ventilating has been carried out by Messrs. Ashwell & Nesbit, of Leicester, and the electric light has been installed by Messrs. Wippell, Brothers & Row, of Exeter. Mr. Simpson was the clerk of works.

Junior Institution of Engineers. — The summer meeting this year is to be of a special character, in celebration of the Society's coming of age. It will open on Monday morning, June 26th, when the Lord Mayor and the Sheriffs will receive the members at the Guildhall and addresses will be made. In the afternoon there will be a special visit of inspection at St. Paul's Cathedral, under the guidance of the Archdeacon of London and the consulting architect, Mr. Somers Clarke. On Tuesday Woolwich Arsenal will be visited, and a reception given in the evening at the Royal United Service Institution, Whitehall. For Wednesday visits have been arranged to the Royal Mint, Messrs. Yarrow's works at Poplar, the North London Railway works at Bow, the Greenwich generating station of the London County Council tramways (where the engines are in course of erection) and to the New Cross Depôt. On the following day an excursion to Chatham will take place, and on Friday visits to Messrs. Doulton's potteries and to the Neasden power-house of the Metropolitan Railway, the afternoon and evening being spent at Earl's Court.

Correspondence.

Competition for Primitive Methodist Orphan Homes, Harrogate.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Having carefully examined the designs sent in for this competition, I desire to make a few remarks about those placed first and second by the assessor, in the hope that some competitor may confirm or correct my conclusions. My first impression, after looking over the twenty-five or thirty sets of plans, was that there were at least a dozen much superior to and more practical than those selected.

First-premiated Design.—The disposition of the buildings on the site is about the worst in the room, for the following reasons:—(1) The only view from the site is towards the south-east, over Pannal Ash Road, and this design shows the view blocked by the master's house and gardener's lodge. (2) The "homes" are placed at right angles to Pannal Ash Road in two rows facing each other, one block thereby obstructing the view of the other. (3) The only windows of the principal living-rooms of each house, being at the ends of the blocks, face and look right into the only windows of the living-rooms of the adjoining block, and the distance between the two bay windows, which face one another, is only 3 yds. or 4 yds.; hence the occupants of one block will be able to see right into and all over the living-rooms of the next block. (4) One-half of the living-room windows look directly into the back out-offices of the adjoining block and face the north-east. (5) The space between the two rows of homes (which are so close together that they practically form a street) is shown to be laid out as ornamental gardens, which is almost useless, besides being expensive, while the playfields are at the two extreme corners of the site—not at all convenient if the boys and girls are to have separate playfields; besides, the position is not good for supervision.

My objections to the planning of the homes are:—(1) There is no pantry accommodation: only a small closet under the front staircase, to gain access to which it is necessary to cross the front hall. There should be at least five times the pantry and store accommodation, and it should adjoin the kitchen and scullery, and not be in the front hall. (2) There is no separate bathroom, the bath being placed in the same room (12ft. by 7ft. 6ins.) as the lavatories—a most objectionable feature, for obvious reasons. (3) There is no space at all either inside or outside for boot-cleaning and similar work, which is usually done by the children. Everything of this kind will have to be done in the small scullery. (4) There is no clothes'-room upstairs; only a small closet not large enough for a two-room cottage, and there is no inside w.c. for emergency use. I have some similar notes on the master's house and lodge plans, but leave these for the present.

The get-up of the drawings is excellent; indeed, I have rarely seen such effective pictures. The cost, however, is altogether exceeded. The stipulated sum was £1,000, and I am informed that at 6d. per ft. cube the first-premiated design comes to £1,950.

As to the design placed second, I need only say that the author puts the lodge at the entrance and the master's house at the very farthest part of the site, so that in order to gain access to it one has to pass all the homes. The estimate is £1,150—and too low at that.

It will no doubt be stated that all these defects can and will be remedied, but to my mind the competition is most unsatisfactory.—Yours truly, "HARLOW MOOR."

YORK MINSTER.

The Question of the Flying Buttresses.

THE proposal of Mr. Bodley to put flying buttresses on the south side of York Minster nave, referred to in our last issue, is still the subject of controversy. Mr. John H. Fearnley writes in the "Times" in support of Mr. Bodley, and asks Mr. Thackeray Turner why he assumes that no flying buttresses previously existed, and how he accounts for the "springs" which exist at the tops of the aisle buttresses and the rough broken masonry of the clearstory walls showing where the old flying buttresses were once joined. "Does he think that the old builders would have left such glaring excrescences on the building had they abandoned their intention of erecting flying buttresses, when it would have been such an easy matter to have removed these excrescences?"

Mr. Richard Hankin answers the question as to the existence of flying buttresses. He says: "It is quite certain that when Drake wrote his History of York (published 1736) they were not in existence then, because he remarks on their absence. The theory advanced by Willis in 1846 is the one which best explains the facts of the case. The builders intended to erect a stone vault, and made their arrangements accordingly. Buttresses with heavy pinnacles were erected at the south side (the explanation of this being that the building of the nave was begun on the south); toothings were left in the clearstory walls in order that the flying buttresses might be connected; and, in the interior, the vaulting shafts were carried up to the top of the clearstory walls. The width of the nave seems to have effectually frightened the builders, and, instead of carrying out their original intention, they contented themselves with putting on a roof of wood, which was groined and painted to look like stone. The explanation of this unusual deception most probably is that everything was arranged for a stone roof, and that a hammer-beam or other wooden roof could not be put on without considerable alteration to the clearstory walls. The flying buttresses had not been erected, and with a wooden roof they would not be necessary. As Mr. Turner observes, their erection to-day will take from, instead of adding to, the strength of the building.

"On historical grounds their erection is still more to be condemned. York Minster is an historic document, illustrating in an admirable manner the changes which have taken place in architecture and the spirit in which the Gothic workman did his work. . . The mediæval builders were intensely practical. . . It is this practical spirit which the absence of flying buttresses on York Minster illustrates. Buttresses were not needed; therefore they were not erected, in spite of the arrangements that had been made.

"From an artistic point of view the new work is also to be regretted. The range of clearstory windows on the north side of the nave, unbroken by any pinnacles, is the finest feature the Minster possesses. The erection of buttresses and pinnacles will inevitably break this up, and instead of a range of windows there will be a number of single windows divided from each other by a modern pinnacle and buttress."

Mr. Hankin is strong on the "practical spirit," but we fail to see where it applies in respect of a sham stone vault constructed of timber. Mr. Bodley's point is that the roof is pushing out the clearstory walls, and critics neither disprove the existence of this outward thrust nor do they suggest how it is to be met. It is not practicable to talk of erecting an open trussed roof in place of the sham vaulted one, and as a choice of evils the flying buttresses certainly seem the best solution.

Keystones.

A new Salt-water Swimming-bath at Rhyl has been erected in Sussex Street. It is the regulation polo size, 75ft by 30ft., and contains 75,000 gallons.

Houses of Historical Interest.—Memorial tablets are to be placed on 64, Duncan Terrace, Islington, once the residence of Charles Lamb; and on 31, Baker Street, W., once the residence of Edward Bulwer Lytton.

New Bradford Hospitals.—The Local Government Board have authorized the erection by the Bradford Guardians of children's and maternity hospitals and homes for the poor at Daisyhill, at a total cost of £21,700.

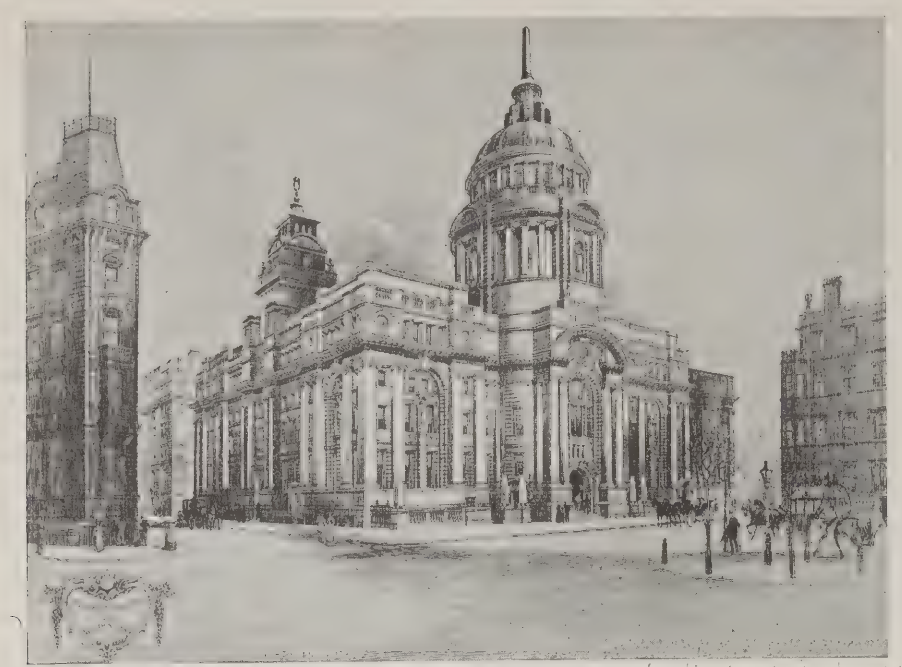
Renovating a Bridge.—Scottish architects are interested in the renovation work of the old stone bridge over the River Eden, near St. Andrews. This bridge dates from the fifteenth century, and careful rebuilding of certain portions is necessary to preserve the structure.

Screen at Aldenham Church, Herts.—We are informed by the architects (Sir Arthur Blomfield & Sons) that this screen, illustrated in our issue for June 7th, was carried out by Messrs. Cornish & Gaymer, of North Walsham, not by Messrs. J. Thompson & Co., of Peterborough, as stated. Messrs. Cornish & Gaymer also executed the screen at Swaffham Prior Church, illustrated in the same issue.

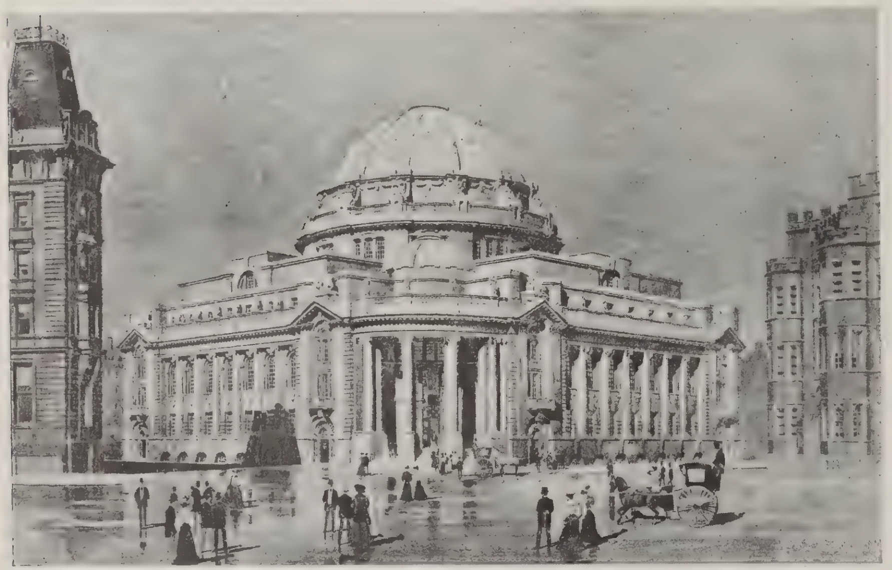
Derwent Valley Waterworks Scheme.—Good progress is being made with this scheme, the object of which is to supply Leicester, Derby, Sheffield, Nottingham and a few smaller towns with water. The complete scheme provides for the construction of five reservoirs, which will impound 11,000,000,000 gallons of water. The total cost of the works, including filter-beds, aqueducts and pipe lines, will be about £7,000,000 sterling.

Registration and the R.I.B.A. Elections.—At a meeting of the Devon and Exeter Architectural Society held on June 10th Mr. B. Priestley Shires, F.R.I.B.A., president, expressed regret that the R.I.B.A. elections had gone dead against the registrationists, but he still hoped the new council of the Royal Institute would earnestly discover some means for the uplifting of the profession, especially for provincial members, who felt the importance of registration perhaps more than their town brethren.

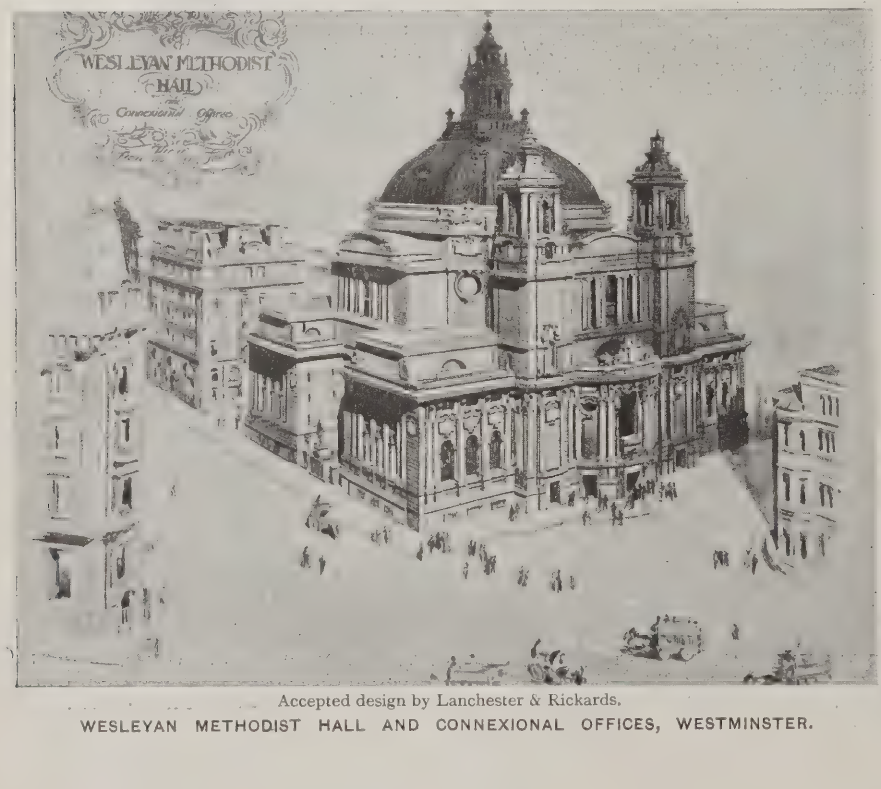
Visit to a Brickworks.—The students of the architectural class at the Gloucester Municipal School of Art recently paid a visit to the new brickworks at Cinderford, where they were received by Mr. Sampson, the general manager. The ground has three distinct clays—(1) the surface clay which makes what is known as Ruabon bricks, (2) a shale which burns a salmon colour and is specially suitable for engineering work, (3) a fireclay. The brickworks are equipped with "Whittaker" semi-plastic plant, capable of turning out from 90,000 to 100,000 bricks in an ordinary working day. The rubbish from the coal-pit adjoining is utilized. First the shale is dumped into a revolving pan, through the perforated bottom of which it falls when ground, and is then automatically taken through the plant, coming out on the other side as finished bricks. The students were informed that the Great Western Railway had tested the bricks and found that the crushing power was no less than 620 tons to the square foot. The company use down-draught kilns, each containing 20,000 bricks, and they intend to add a glazing plant, as the clays have been found admirably adapted for this purpose.



Design by Waddington, Son & Dunkerley.



Design by Crouch & Butler.



Accepted design by Lanchester & Rickards.

WESLEYAN METHODIST HALL AND CONNEXIONAL OFFICES, WESTMINSTER.

Competitions.

Swindon School Competition. — Messrs. Nicholls & Stockwell, of Winchester, are the successful architects for a new school in Ferndale Road, Swindon.

Bristol School Competition. — Seventeen designs were submitted in the competition for a three-department school at Rose Green, Bristol, to accommodate 1,190 children. The selected design is by Messrs. Herbert J. Jones & Son, of Bristol.

Sheffield Housing Scheme.—Mr. E. M. Gibbs, the assessor, has made the following awards in the competition among local architects for twenty dwelling-houses for the Sheffield Corporation at High Wincobank :—1st, Mr. H. L. Paterson ; 2nd, Mr. W. Spencer Smith. Twenty designs were received.

Obituary.

Mr. Patrick Crawley, builder, of Doncaster, was found dead in bed on Tuesday last week.

Mr. James Haugh, a well-known building contractor in the Stewartry of Kirkcudbright, died recently at Castle Douglas, aged 62.

Mr. J. Mansergh, the well-known engineer, died last week, aged 71. He was much connected with railway and water works. In the early 'nineties he became adviser to the Birmingham Water Committee, and his great scheme for the conveyance of water from the Elan Valley to Birmingham was brought to a successful conclusion last July, when the King opened the Welsh works. He was engaged by a number of municipalities in schemes of water-supply and sewage-disposal, and acquired world-wide renown as an authority on these subjects. In 1899 he went out at the request of the Victorian Government to report upon the drainage of Melbourne and district, and also visited Ceylon, Toronto and other places in North and South America, and the Malay Peninsula, for similar purposes. In 1900 Mr. Mansergh was president of the Institute of Civil Engineers. He was also a Fellow of the Royal Society.

DIRECT ELECTION TO FELLOWSHIP, R.I.B.A.

IN reply to the memorials addressed to the Institute by Associates at Leeds and members in practice at Sheffield protesting against the nomination by the council of candidates for Fellowship who have not passed the examination for admission as Associates, the secretary (Mr. W. J. Locke) recalls the fact that at the Institute meeting held on February 29th, 1904, a resolution was passed that "during the intervening period every architect eligible under the Charter for election who desires to join the Institute as a Fellow should be encouraged to do so." Mr. Locke then adds : "If the council rejected candidates whom they found not only eligible under the Charter, but eligible by their executed works for admission as Fellows, on the ground that they had not passed the examination, they would be acting contrary to the mandate given to them by the general body of the Institute. The reason which led to this resolution of the general body was that it was not fair or politic to call suddenly on architects between thirty and forty years of age, in the full tide of busy practice, to pass an examination under penalty of being excluded for ever from the Institute. I may add that the same principle was adopted before examination for admission to the Associate class was made compulsory in 1882."

Prof. Beresford Pite has been appointed director of architectural instruction and lecturer on architectural subjects at the L.C.C. School of Building at Brixton.

A BUILDING ACT OF 240 YEARS AGO.

AT a time when the amendment of the London Building Acts is so much to the fore, it is opportune to turn to the enactment for the rebuilding of the City of London after the Great Fire. Some particulars are given in the "Land Agents' Record" for June 3rd.

"To the end that all builders may the better know how to provide and fit their materials for their several buildings" it was ordained that there should be "four sorts of buildings and no more." First, those fronting by-lanes, which should be two storeys high, besides cellars and garrets; secondly, those "fronting streets and lanes of note and the river of Thames," three storeys high, besides cellars, &c.; thirdly, those fronting "high and principal streets," four storeys high, besides cellars and garrets; and fourthly, "mansion houses for citizens or other persons of extraordinary quality, not fronting either of the three former ways. And the roofs of each of the said first three sorts of houses respectively shall be uniform."

The Lord Mayor and his colleagues were to decide which should be by-lanes, which lanes of note and which high streets.

Of the Building with Brick.

"As the building with brick" was "not only more comely and durable but also more safe against future perils of fire," all buildings were to be constructed externally of brick or stone, or substantial oak timber, "for the conveniency of shops. Doors, brest summers and window frames to be sufficiently discharged of the burthen of the fabrick by arch work of brick or stone, either strait or circular." Party-walls and piers, set out equally on each builder's ground, were to be built by the first beginner and paid for by the other, to the full moiety of the charges, with interest at the rate of 6 per cent. per annum, the alderman of the ward to decide disputes.

Cellars were to be "6 foot and a half high (if the springs of water hinder not)," first storeys 9ft. to 10ft., second storeys 10ft. to 10ft. 6ins., and third storeys 9ft.

The brickwork of the third-class houses was to be 2½ bricks to the first floor, 1½ bricks to the garret floor, and above that one brick, party-walls being of nearly the same respective thicknesses.

How Disputes were to be Settled.

All rebuilding was to be done within three years, under penalty of forfeiture of the site, and in order that builders should receive due encouragement two judges of the King's Bench, "in case of combination or unreasonable exaction by brick makers, tile makers and lime burners," were to call upon such a number of those tradesmen as they saw fit and *in conference with them*, if present (or otherwise in their absence), assess such reasonable prices for materials and carriage "as may *equally* respect the honest profit of the said brick makers, &c., and the necessity and conveniency of the builder." And in order that no artificer, workman or labourer might "make the common calamity a pretence to extort unreasonable or excessive wages," the justices of the King's Bench might, on the complaint of the Lord Mayor, from time to time limit, rate and appoint the wages of such artificers, &c., by the day, week or otherwise, or "by the great, by the foot, yard, rod or perch, or for any other quantity," the said rates and prices to bind all persons concerned, one month's imprisonment being the penalty for any breach of the rule. Foreigners or strangers were free to work with citizens and after seven years might claim the freedom of the city.

Differences between builders "about stopping lights, windows, water courses or gutters" were settled by the alderman of the ward or his deputy. "Sewers, drains and vaults" were under the direction of the Lord Mayor, who could also prohibit trades which he should judge "noisom or perilous in respect of fire," and remove conduits and like erections which interfered with that "openness of the streets which conduceth much to the advancement of trade."

The Act ends with a schedule of proportions and scantlings for storeys, walls and timbers, making ample provision for sound walling and timberwork, with "scantlings for sawn timber and laths, usually brought out of the West Country," and for sewers, 3ft. wide by 5ft. high, with side walls one brick and a half thick, arches one brick on end, and bottom paved plain. All roofs, window frames, cellar floors and tile pins were to be of oak, and "no joists to lie less than 8ins. into the wall, and to be laid in loam."

And so the Act goes on, dealing sanely, effectively and equitably with a very serious situation. There is no record of its having been opposed on party grounds, and nothing is heard of those who might conceivably have conscientious objections to the demolition of their property for the public good. It only appears that, under this Act, improvements were made which would now, in similar circumstances, be the subject of enquiry by Royal Commissions for many years, would be delayed by strikes, be made almost impossible by corners in materials, and be subject to regulations "for the better prevention of fire or otherwise" which would certainly not conduce to the "gracefulness" of the new buildings.

ILLUSIONS AND REFINEMENTS IN MEDIAEVAL ARCHITECTURE.

WRITING to the "Scotsman" in reference to the exhibition of Mr. Goodyear's collection of "architectural refinements" which is to be held in August at the Scottish National Portrait Gallery, Edinburgh, as announced on p. 308 of our issue for May 31st, Mr. Thomas Ross says:-

"It has been long known to students of mediæval architecture that great irregularity exists in the disposition of the parts in buildings of that period, that the side walls are often neither parallel nor straight, that cross walls are not at right angles, that pillars are spaced at unequal distances apart, and that arches which might be expected to rise to the same levels are irregular. Inequalities such as these have usually been attributed to indifference on the part of the mediæval architects to small details. . . . But lately it has been contended that these irregularities are perspective illusions and refinements. During the last thirty or forty years a very systematic and scientific examination has been made of the early Christian churches in Italy by Prof. W. H. Goodyear and his assistants for the Brooklyn Institute Survey. The investigations have excited considerable public interest, not only from this being the first attempt to explain these phenomena, but from the fact that they are shown to be the results of well-studied refinements on the parts of mediæval builders carrying out the traditions of the Greek architects coming down through Byzantium. These refinements existing in the Greek temples were first made known by Mr. Pennethorne and Mr. Penrose about the middle of last century, and are now universally admitted to be great principles in the design of those buildings, although previously believed to have no special meaning, as in the present instances of the bends and curves of mediæval churches. . . .

"The exhibition of Mr. Goodyear's drawings may prove to be not without a local interest to us in Scotland, in view of the many peculiarities that are known to exist in our cathedrals and abbey churches. There are the deflection southwards of the choir of St Giles' from the line of the nave; the deviation of the line of Dunblane from the line of its older tower; the leaning outwards of the west end of Paisley Abbey; and the sweep of the side walls of Kirkwall, the bend of some of its horizontal lines, and the rise of its floor. There are the great entasis of the tower of Iona, with its west window leaning northwards, the curious irregularity of the west front of Dunkeld, and many other examples which need not be cited here."

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Party-walls.

LONDON.—BELGRAVIA writes: "What steps must be taken to recover the value of an external wall agreed (verbally) to be used and paid for (and now used) as a party-wall, but in regard to which no award was drawn up, nor any correspondence? The party-wall notice was served by the building owner."

Under the London Building Act, 1894, a written account should have been delivered to the adjoining owner within one month of completion (section 96), giving "particulars and expenses of the work." If the adjoining owner makes no complaint within another month (section 97), it is to be assumed that he accepts the situation, and the building owner may recover the amount as an ordinary debt (section 98). I am of opinion that if a proper account has been rendered and demand made for payment, you will be able to recover the amount, even though the strict procedure of the Act has not been complied with. It will probably be necessary to give formal proof of the verbal agreement as to the party character of the wall.

F. S. I.

Sketching at Christchurch Priory; Buildings to Measure around Bournemouth.

THORNTON HEATH.—E. E. H. writes: "To whom should I write for permission to sketch and photograph at Christchurch Priory Church; also what interesting buildings are there within eight miles of Bournemouth?"

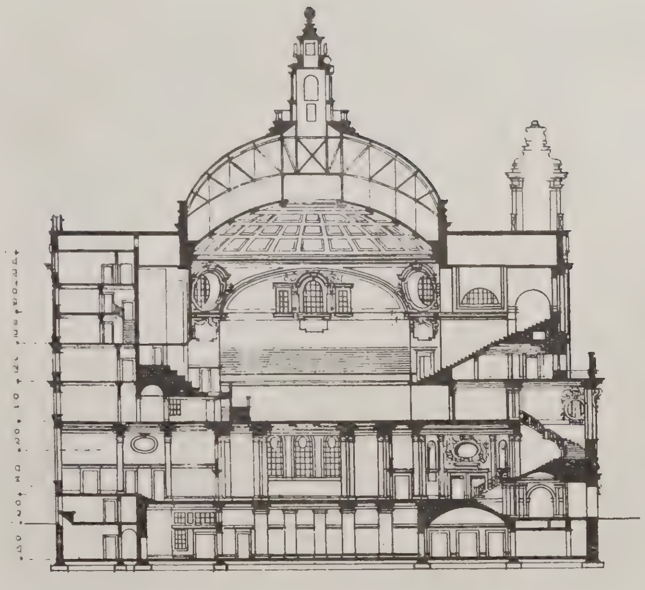
Apply to the Rev. Zachary Nash, M.A., Christchurch Vicarage. There are very few buildings of any architectural interest in the vicinity of Bournemouth. Sopley Church, Wimborne Minster and the parish church at Swanage are all worth visiting. St. Peter's Church, Bournemouth, by the late G. E. Street, is a beautiful example of modern Gothic.

L. S. R.

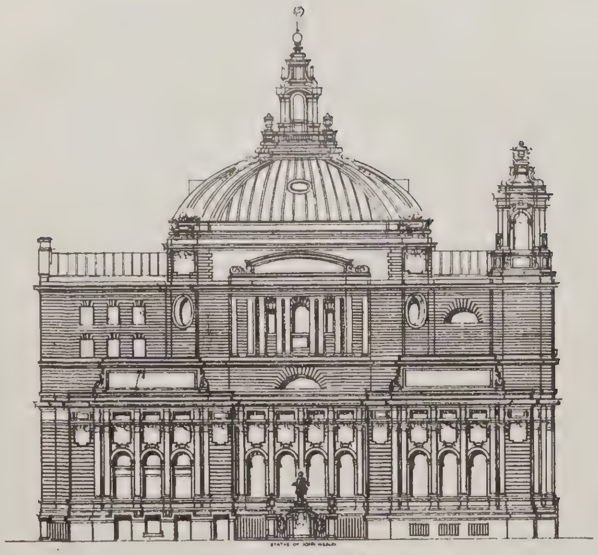
Drainage of Slab and Sink in Fish Shop.

JEDBERGH.—SUBSCRIBER writes: "I send sketches (not reproduced) showing an arrangement of a marble slab and sink for a fish shop. Which is the best way to drain the two? Are the traps liable to syphonage?"

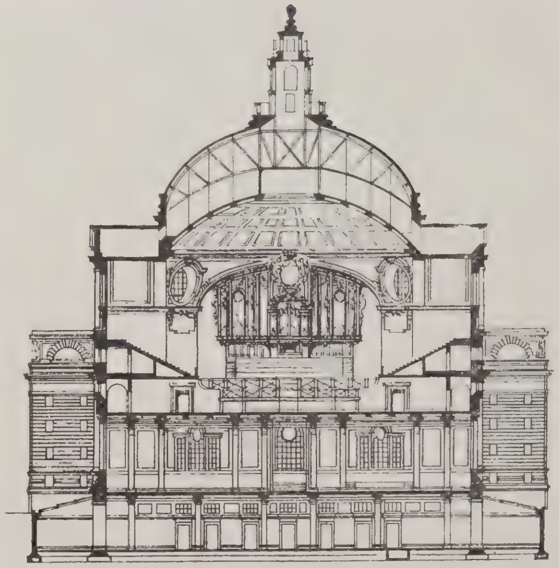
Neither of the arrangements shown would in practice be found satisfactory. In most fish shops there is a straight down-pipe from both slab and cleaning sink discharging over a gulley in the floor: but this is not a good arrangement. A better way is to have straight down-pipes delivering into an open channel which discharges over the gulley outside; this channel would be washed out daily with the rest of the floor. If an open channel is undesirable it can be covered with a removable grating. The traps in the arrangements shown, apart from the risk of syphonage, would be easily choked and the pipes themselves would speedily become foul.



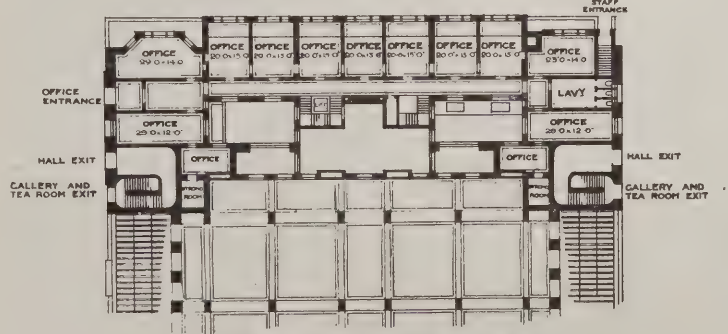
SECTION A A



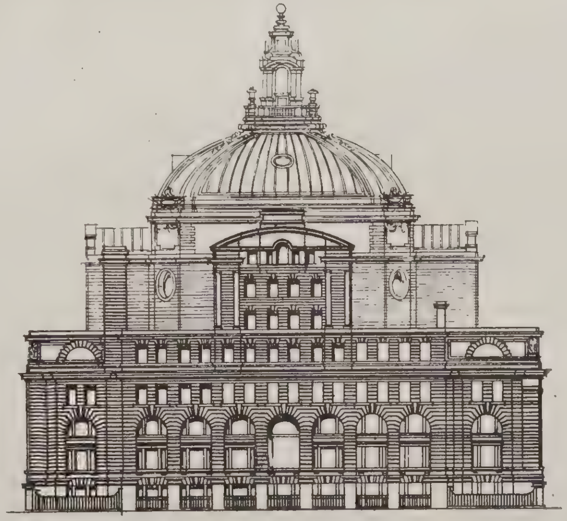
SOVTH ELEVATION



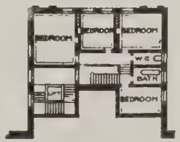
SECTION B B



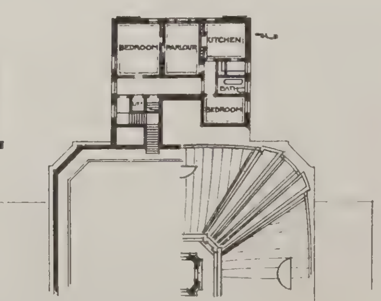
MEZZANINE AT GROVND LEVEL



WEST ELEVATION

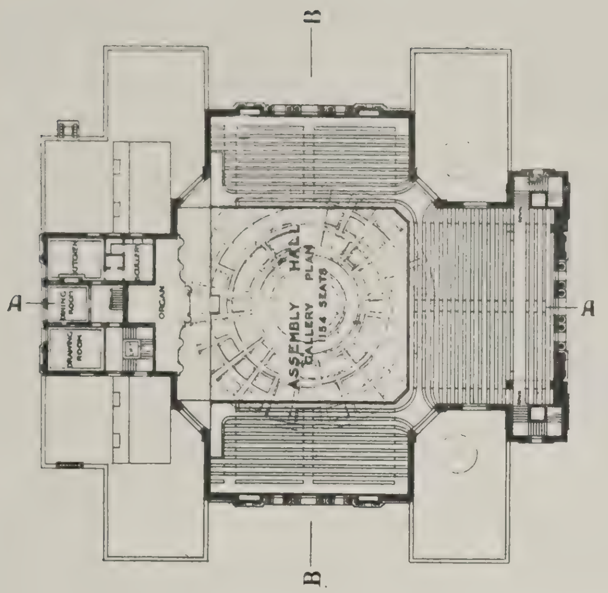


FOVRTH FLOOR
LIBRARIANS HOUSE

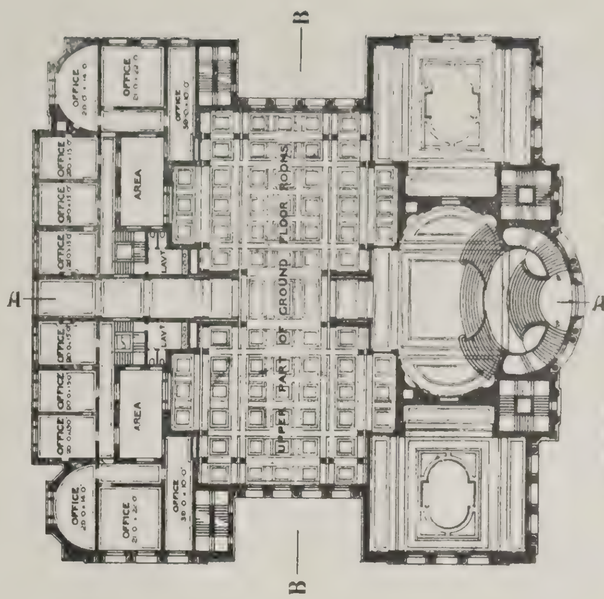


FIFTH FLOOR
CARETAKER

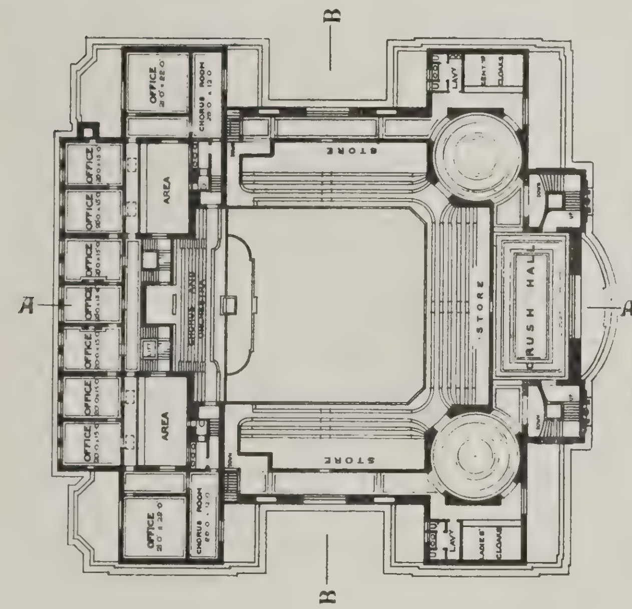
WESLEYAN METHODIST HALL AND CONNEXIONAL OFFICES WESTMINSTER: ACCEPTED DESIGN BY LANCHESTER AND RICKARDS.



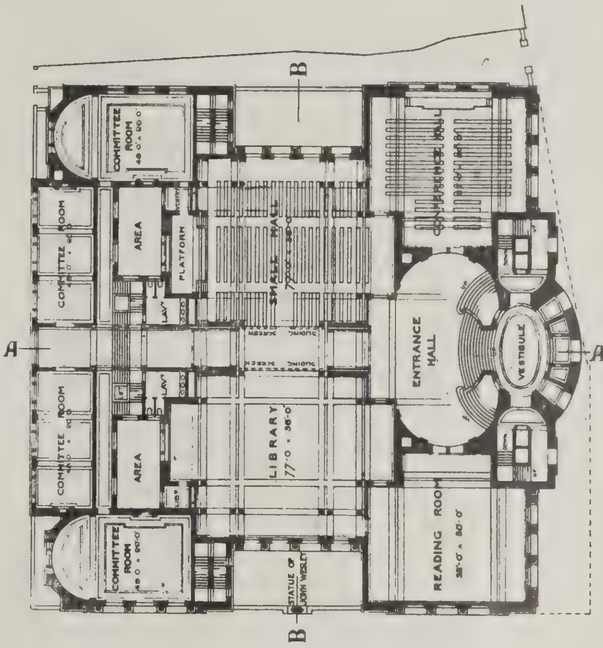
THIRD FLOOR PLAN



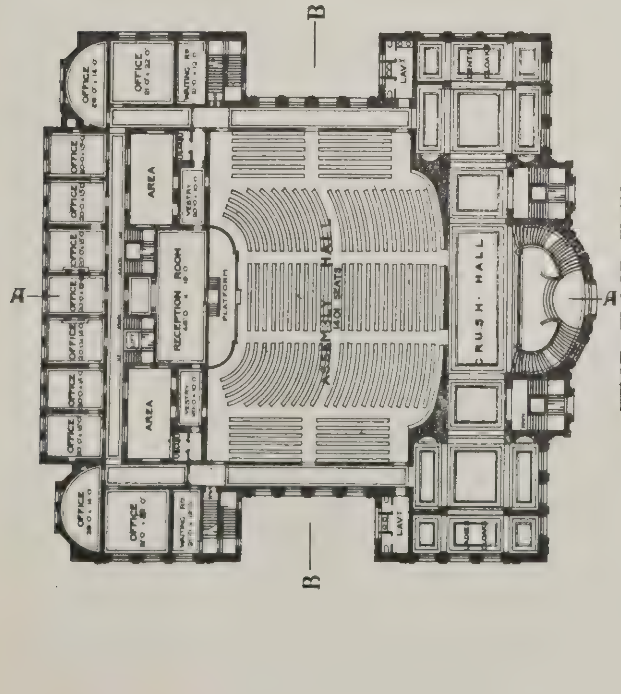
MEZZANINE ABOVE GROUND FLOOR



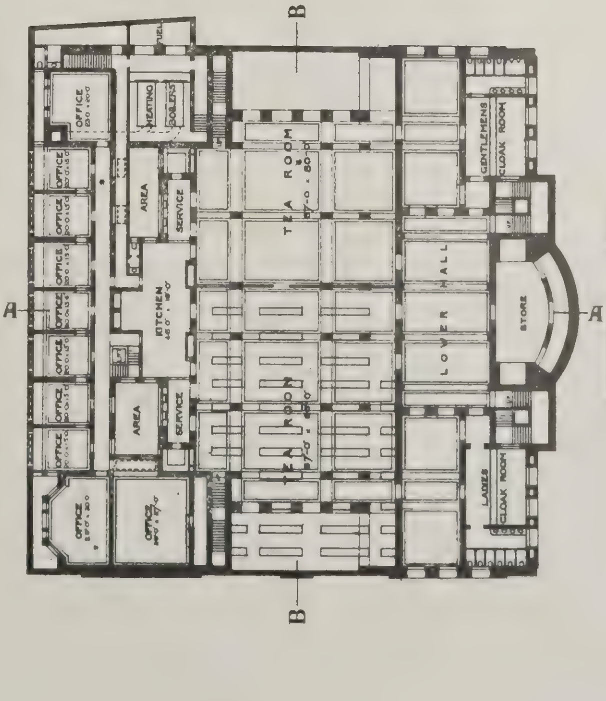
SECOND FLOOR PLAN



GROUND PLAN



FIRST FLOOR PLAN



BASEMENT PLAN

WESLEYAN METHODIST HALL AND CONNEXIONAL OFFICES WESTMINSTER: ACCEPTED DESIGN BY LANCHESTER AND RICHARDS.

Builders' Notes.

Messrs. R. J. Nicholson & Co., of 26, Cannon Street, Manchester, have been appointed sole agents in Manchester and district for Messrs. Joseph Richmond & Co.'s lifts and cranes.

Boiler Explosions. — The twenty-second report of the Board of Trade, just issued, states that during the twelve months ended June 30th, 1904, nineteen persons were killed and forty-five injured by boiler explosions. This is below the average. As in past years, neglect was the primary cause.

Charge of Address.—Messrs. Wailes, Dove & Co., Ltd., sole manufacturers of patent "Bitumastic" enamels, have moved to new offices at 10 and 11, Lime Street, E.C. (exactly opposite No. 35, where they have been for the past fifteen years). New telephone number: 174 Avenue.

Protection and the Granite Trade.—At the annual meeting of the Shap Granite Co., at Penrith, the directors attributed the falling off in the volume and profits of the company's business to increasing competition in all departments. Unless some system could be devised for protecting the interests of the British granite quarries it was certain that many would have to be closed.

The Sand-Blast Process for Cleaning Stone and Brickwork is being conducted on a commercial basis by Messrs. Farnham, Ltd., of Victoria Street, S.W. The blast is produced by an air compressor, either fixed or portable, and is conveyed to an atomizer which picks up the sand; this is then carried through a hose and projected through a nozzle against the surface to be cleansed. The compressor is driven by an electric or petrol motor. A preservative process employed by the firm consists in injecting liquid paraffin wax into the stone or brickwork.

Edinburgh Decorative Trades' Exhibition.—At a gathering held by the executive committee of the recent exhibition of the decorative trades in Edinburgh, Councillor W. W. Macfarlane, president of the National Association of Master Painters in Scotland and of the Edinburgh and Leith Master-Painters' Association, was presented with a solid silver rose bowl by the local association as a memento. Councillor Macfarlane expressed the hope that the example set by the decorative trades would be followed by other trades, as such exhibitions tended to advance the highest interests of the various crafts, besides being a source of profit to the promoters, pleasure to the public, and good comradeship to the members.

L.B.A. (Amendment) Bill: Mr. Riley cross-examined.—The London County Council have agreed to modify clauses 96 and 97 of the Building Acts Amendment Bill, having reference to high buildings, and the requirements will not apply to new or old dwelling-houses occupied by not more than one family. Mr. W. E. Riley, architect to the Council, stated recently before the Select Committee of the House of Commons that in 208 of the principal streets of London he had found 1,136 buildings of between 50ft. and 60ft. in height and 298 over that height. It had been found impracticable to issue by-laws in respect to buildings over 60ft. high under the Act of 1894. The Council had carefully considered the clauses in relation to means of escape from and prevention of fire, and attaching special importance to means of escape; they also desired that the prevention clauses should be dealt with without delay, but other amendments of the Building Acts would be deferred till next session. The chairman asked whether the prevention clauses would be pressed now or withdrawn for inclusion in next year's Bill. Mr. Fitzgerald, K.C., explained that the intention was that the district surveyor should send a list of buildings to which the Act would apply, and it would rest with the County Council to set the Act in motion or not. They might serve a notice, but the ordinary course would be for the Council to send a surveyor to examine the building, and, on receipt of his report, if additional means of escape were considered necessary, notice would be served. Unless the Council saw reason for it, the owner would not be required to send in plans.

New Companies.

Sand-Blast and Ceramique Co., Ltd., 3 & 4, Howard Buildings, Central Street, E.C. Capital: £1,000.

Sculptures, Ltd., Grosvenor Mansions, 82, Victoria Street, S.W. Capital: £50,000.

M. H. Redhead and Co., Ltd., timber merchants, Cyprus Road, Marsh Lane, Bootle, near Liverpool. Capital: £1,500.

Alexander Liggat & Co., sanitary engineers and brass-founders, Caledonian Brass Works, Barrhead. Capital: £8,000.

Baltic House, Leadenhall Street, E.C., has just been completed for the City Offices Co. The elevations are of Portland stone and granite. The entrance, corridors and staircase are of various kinds of marble, with mosaic floors. The numerous offices are provided with every modern convenience, and most of them have fumed oak joinery and fittings. The architects were Messrs. Gordon & Gunton, and the builders Messrs. Patman & Fotheringham, Ltd., of 100 and 102, Theobald's Road, W.C., and Liverpool Road, N.

MANCHESTER SOCIETY OF ARCHITECTS.

On June 3rd the members of this Society visited Norbury Church, Derbyshire, a very interesting and unusual church. Originally there seems to have been a Norman nave, to which was added a fourteenth-century chancel, and on the south side a tower. Later, in Perpendicular times, the nave was rebuilt with a north aisle, and the spaces on each side of the tower were occupied by chapels; the latter are low, and the result is a charming example of grouping both outside and inside. The glory of the church, however, is its magnificent stained glass, the colour of the fourteenth-century glass in the north and south windows of the chancel being very delightful. The east window is rather a jumble of bits of fifteenth-century glass from the nave, good in themselves, but not forming one design. The red-brick Marton House adjoining the church well deserves notice.

An Elizabethan Mansion.

Wootton Lodge was next visited, by kind permission of Col. B. C. P. Heywood, who entertained the members to luncheon and devoted the afternoon to showing them round the house and its beautiful gardens. The house is an excellent example of a stately Elizabethan mansion, with very beautiful natural surroundings. The entrance front is particularly fine; two low buildings, stables, &c., mark the angles of the enclosed forecourt, through which an elliptical drive leads to a great flight of steps rising to the main entrance porch: this is carried up to the parapet and is enriched with heraldic carving: on either side are long windows four storeys high, with great mullion and tremoine windows: while just visible around the corner on either flank are similarly lofty circular bays. The front is surrounded by a balustrade. The gardens are very pleasing, with terraces and broad flights of stone steps and a most unexpected little "frond garden" on the top of a crag behind the house.

A Museum of Arts and Crafts.

On June 8th the Society visited the Manchester Arts and Crafts Museum, attached to the School of Art. Brief comments on the principal objects of an architectural character were made by Prof. S. H. Capper and Mr. P. E. Corbett; and the headmaster, Mr. R. Glazier, gave a most interesting account of some of the handicrafts represented in the museum, notably of glass and pottery.

A new General Post-Office at Buxton is being erected in Station Road. Mr. W. Pott, of H.M. Board of Works, is the architect, and Messrs. Dennis Gill & Sons, of Doncaster, are the contractors.

Complete List of Contracts Open.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		BUILDING:		
June	22	Ramsbottom—Improvement to School	——	Rev. J. J. Lewis, Vicarage, Ramsbottom.
,,	22	Lightcliffe, Yorks—Bungalow	——	R. Berry, Commercial Street, Halifax.
,,	22	Hadfield—Bakery	Co-operative Society, Ltd.	Office, Wesley Street, Hadfield.
,,	22	Bristol—Laundry	Education Committee	P. Addie, Council House, Bristol.
,,	22	Binbrook, Lincs—Repairs to Roof of Church	——	T. H. Elliott, Binbrook.
,,	22	Dinas, Wales—Repairs to Chapel	——	J. Rees, 51 Dinas Road, Dinas, Rhondda.
,,	22	Portscatho, Cornwall—Additions to School	——	Gerrans School, Portscatho.
,,	22	Dundalk—Gymnasium	Incorporated Society	W. S. Barber, Francis Street, Dundalk.
,,	23	Wreay, Cumberland—Alterations to School	——	J. Graham, Bank Street, Carlisle.
,,	23	Nelson, Wales—Improvements to Chapel	Trustees	Rev. J. O. Jenkins, 6 Beech Road, Nelson.
,,	23	Henley-in-Arden, Stratford-on-Avon—Mortuary	Rural District Council	J. Brook, College Street, Stratford-on-Avon.
,,	23	Hopkinstown, Pontypridd—Chapel	Trustees	T. Rosser, Oakfield Villa, Pwllgwaun, Pontypridd.
,,	23	Luton—Bandstand	Town Council	Borough Engineer, Luton.
,,	23	Llansantffraid, Glyn Ceiriog, Wales—Additions to School	Education Authority	Headmaster, Council School, Llansantffraid, Glyn Ceiriog
,,	23	Lancaster—Park Structure	——	Borough Surveyor's Office, Lancaster.
,,	23	Lancaster—Masonry Structure	——	J. Belcher, 20 Hanover Square, W.
,,	24	Weston-super-Mare—School	Education Committee	Samson & Cottam, 1 Hammett Street, Taunton.
,,	24	Middlesbrough—Schools	Education Committee	R. Lofthouse & Son, 62 Albert Road, Middlesbrough.
,,	24	Dorchester—Repairs at Police-Station	Standing Joint Committee	E. A. Ffooks, Sherborne.
,,	24	Rhyl, North Wales—Library	Urban District Council	A. A. Goodall, Council Offices, Clwyd Street, Rhyl.
,,	24	Abingdon—Ward Block	Joint Hospital Board	J. G. T. West, The Knowl, Abingdon.
,,	24	Chester—Erection of Shedding, &c.	Agricultural Association	T. A. Beckett, St. Werburgh Chambers, Chester.
,,	24	London, S.E.—Alterations to Schools	Bermondsey Borough Council	Town Clerk's Office, Town Hall, Spa Road, S.E.

Complete List of Contracts Open.—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING—*cont.*		
June 24	Taunton—School of Art	Education Committee	Sampson & Cottam, 1 Hammett Street, Taunton.
,, 24	Ynysybwl, Wales—Alterations to Chapel	Trustees	Morgan & Elford, 1 Jeffrey Street, Mountain Ash.
,, 26	Ferndale, Wales—Extensions to Chapel	—	W. Lewis, Duffrey Street, Ferndale.
,, 26	Ilford—Cottage	Urban District Council	H. Shaw, Town Hall, Ilford.
,, 26	Cheshunt, Herts—Petty Sessional Court	County Council	U. A. Smith, County Surveyor, Hatfield.
,, 26	Darlington—Renewing Stonework	Corporation	George Winter, Borough Surveyor, Darlington.
,, 26	Barry—Masonic Hall	—	J. A. Owen, Main Street, Cadoxton, Barry.
,, 27	Bromley, Middlesex—Works to Operating-room	Managers, Sick Asylum District.	J. & W. Clarkson, 136 High Street, Poplar.
,, 27	Caerphilly—Hospital	Urban District Council	U.D.C. Offices, Caerphilly.
,, 27	London, W.C.—Patent Office Extension	Commissioners	Secretary, H.M. Office of Works, Storey's Gate, S.W.
,, 27	Bexhill—School	Education Committee	Secretary, Education Committee, Amherst Road, Bexhill.
,, 27	Ilford—Iron School Building	Urban District Council	C. J. Dawson, 11 Cranbrook Road, Ilford.
,, 27	Leyton—School Works	Urban District Council	W. Jacques, 2 Fen Court, E.C.
,, 28	Ulverston—Alteration to House	Liberal Club, Ltd.	Settle & Brundrit, Ulverston.
,, 28	Rotherham—Shops, &c.	Corporation	W. J. Board, Town Hall, Rotherham.
,, 29	London, S.W.—Repairs, &c., to Library	Lambeth Borough Council	H. Edwards, 346 Kennington Road, S.W.
,, 30	Willesden—Repairs to School	Education Committee	G. E. T. Lawrence, 22 Buckingham Street, Adelphi.
July 1	Prestwick, Ayr—Twelve Houses	C. W. Andrew	A. L. Mercer, Ayr.
,, 3	Tipton—Renovation of School	Urban District Council	E. Richards, Education Offices, Owen Street, Tipton.
,, 3	Widnes—Repairs to House	—	J. S. Sinclair, Borough Surveyor, Widnes.
,, 3	Tipton—Alterations to Schools	Education Committee	A. Long, 21 New Street, West Bromwich.
,, 5	Bristol—New Schools	Education Committee	W. B. Wood, 12 Queen Street, Gloucester.
,, 5	Prestwick, Ayr—Six Pairs of Semi-detached Cottages	Wyllie & Co.	A. L. Mercer, Ayr.
,, 6	Gainsborough—School	Education Committee	Scorer & Gamble, Bank Street Chambers, Lincoln.
,, 10	Sudbury—Sanitary Annexes	Guardians	Workhouse, Sudbury.
	ENGINEERING:		
June 22	Cricklewood, Middlesex—Reservoir, &c.	Metropolitan Water Board	District Secretary, New River District Offices, 173 Rosebery Avenue, E.C.
,, 22	Darlington—Valves, &c.	Corporation	Mr. G. Winter, Town Hall, Darlington.
,, 22	Edinburgh—Alterations to Steel Pipe-work	Corporation	Engineer, Dewar Place Station, Edinburgh.
,, 23	Barry, Glam—Purifier Roof	Urban District Council	F. M. Harris, Gasworks, Barry.
,, 24	Shenfield, near Brentwood—Pumping Station, &c.	Rural District Council	Messrs. Jones, Parliament Mansions, Victoria Street, S.W.
,, 26	Ilford—Refuse Destructor	Urban District Council	H. Shaw, Town Hall, Ilford.
,, 26	Leek, Staffs—Sewage Works Extension	Urban District Council	W. E. Beacham, Town Hall, Leek.
,, 26	Edinburgh—Inclined Retort Carbonizing Plant	Gas Commissioners	W. R. Herring, New Street Works, Edinburgh.
,, 27	Southampton—Weighbridge	Corporation	J. A. Crowther, Borough Engineer, Southampton.
,, 27	Tendring, Colchester—Heating Workhouse, &c.	Guardians	Price & Belsham, 52 Queen Victoria Street, E.C.
,, 28	Norwich—Heating Apparatus	Free Library Committee	A. E. Collins, Guildhall, Norwich.
,, 28	Perth—Reconstruction of Quay Wall	Town Council	R. M'Killop, 12 Tay Street, Perth.
,, 28	Alford, Lincs—Lighting	Urban District Council	J. E. H. Sergeant, Clerk, Alford.
,, 30	Rothbury, Northumberland—Water-supply Works	Guardians	A. Snaith, Bolam House, Rothbury.
July 1	Leigh, Lancs—Boiler	—	A. T. Smith, Electrical Engineer, Leigh.
,, 3	Llantwit Major, Wales—Waterworks	Cowbridge R.D.C.	Kirkby Son & Brown, Stone Chambers, Newport, Mon.
,, 5	Naas, Ireland—Meters	Rural District Council	F. Bergin, 36 Westmoreland Street, Dublin.
	IRON AND STEEL:		
June 23	Luton—Iron Fence	Town Council	Borough Engineer's Office, Town Hall, Luton.
,, 24	Manchester—Iron and Steel Work	Gas Committee	C. Nickson, Gas Depôt, Town Hall, Manchester.
,, 24	Nottingham—Cast-iron Pipes, &c.	Water Committee	F. W. Davies, St. Peter's Church Side, Nottingham.
,, 28	London, E.C.—Ironmongery, &c.	Metropolitan Asylums Board	Offices of Board, Embankment, E.C.
	PAINTING AND PLUMBING:		
June 22	Bury, Lancs—Painting, &c., Offices	Joint Water Board	A. W. Bradley, Bank Street, Bury.
,, 23	Cork—Painting and Colouring	County Borough	City Engineer's Office, Municipal Buildings, Cork.
,, 24	Manchester—Colour Washing, &c.	Education Committee	Education Offices, Deansgate, Manchester.
,, 26	Wilmslow—Paints, Oils, &c.	Gas Co.	William Severs, Gasworks, Wilmslow.
,, 26	London, W.—Painting at Infirmary	Guardians	E. H. Sim, 8 Craig's Court, Charing Cross.
,, 26	London, W.—Painting at Schools	Guardians	Superintendent of Schools, Southall.
,, 27	Leyton—Painting at Schools	Urban District Council	W. Jacques, 2 Fen Court, E.C.
,, 29	London, S.E.—Painting, &c., Library	Lambeth Borough Council	H. Edwards, 346 Kennington Road, S.E.
,, 29	Sidcup, Kent—External Painting Work	Guardians	Clerk's Office, Workhouse, East Greenwich.
July 1	Bradford—External Painting of Nurses' Home	Guardians	F. Holland, 11 Parkinson's Chambers, Hustlergate, Bradford.
,, 3	Ecclesfield—Painting, &c., at Schools	County Council	W. Hague, Ecclesfield.
,, 10	Ipswich—Painting and Decorating Work	Education Committee	E. F. Johns, Thoroughfare, Ipswich.
	ROADS AND CARTAGE:		
June 22	Denton, Lancs—Street Works	Urban District Council	G. H. Newton, Town Hall, Denton.
,, 22	North Walsham—Granite	Urban District Council	E. J. Simpson, Surveyor, North Walsham.
,, 22	Romsey—Flints	Corporation	Borough Surveyor, Market Place, Romsey.
,, 23	Wotton, near Gloucester—Road Works	Rural District Council	F. E. Weaver, Lipton Chambers, Northgate Street, Gloucester.
,, 23	Brighton—Portland Cement	Town Council	Borough Engineer, Town Hall, Brighton.
,, 23	Penzance—Road Works	—	O. Caldwell, Victoria Square, Penzance.
,, 24	Washington, America—Paving Bricks	Commercial Intelligence Branch of Board of Trade.	Offices of Board, 73 Basinghall Street, E.C.
,, 25	Beckenham—Making-up Roads	Urban District Council	J. A. Angell, Surveyor, Beckenham.
,, 26	Ilford—Paving, &c.	Urban District Council	H. Shaw, Town Hall, Ilford.
,, 26	London, S.E.—Kerbing	Lewisham Borough Council	Surveyor's Department, Town Hall, Catford.
,, 26	Springhead, Oldham—Road Materials	Urban District Council	Morley Clarke, Springhead, Oldham.
,, 26	Witham—Slag, &c.	Urban District Council	W. B. Blood, Council Office, Witham.
,, 26	Feltham—Granite	Urban District Council	R. T. Stewart, Town Hall Chambers, Feltham.
,, 27	Leyton—Tar Paving	Urban District Council	W. Jacques, 2 Fen Court, E.C.
,, 27	Lewes—Steam Rolling	County Council	F. J. Wood, County Hall, Lewes.
July 5	Rochester—Road Metal	Corporation	William Banks, City Surveyor, Rochester.
	SANITARY:		
June 22	Belper—Sewage Works	Rural District Council	Robert C. Cordon, Duffield, Derby.
,, 22	West Malling, Kent—Sewerage Works	Rural District Council	W. L. Grant, High Street, Sittingbourne, Kent.
,, 23	Askern, Yorks—Sewerage Works	Rural District Council	D. Balfour & Son, 3 St. Nicholas Building, Newcastle.
,, 23	Uppermill—Scavenging	Saddleworth U.D.C.	Council Offices, Uppermill.
,, 26	London, S.E.—Eight Slop-carts, &c.	Lewisham Borough Council	Surveyor's Department, Town Hall, Catford.
,, 27	Goole—Scavenging	Urban District Council	W. H. Allis, Sanitary Inspector, Goole.
July 4	London, S.E.—Sewers	London County Council	Maurice Fitzmaurice, County Hall, Spring Gardens, S.W.
	TIMBER:		
June 26	Leeds—Wood	Gas Committee	R. H. Townsley, Gas Offices, Leeds.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
July 1	Bexhill, Sussex—School	£50, £30 and £20	£1 1s.	Secretary, Education Committee, Amherst Road, Bexhill.
Aug. 1	Hove, Sussex—Library	£50, £30, £20	£1 1s.	H. Endacott, Town Hall, Hove.
,, 1	Perth—Reconstruction of Hall	30, 20 and 10 guineas	—	J. Begg, City Chambers, Perth.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

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ARCHITECT and SURVEYOR'S ASSISTANT DISENGAGED. Twelve years' good general experience, quick and accurate draughtsman. Working and detail drawings, designs, surveys, specifications. Splendid testimonials.. Salary moderate—A. R., Hazlemere, Rusham Road, Egham, Surrey. 1162

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ARCHITECTURAL ASSISTANT (26) wants POSITION in architect's (or engineer's) office. Seven years' experience. Working drawings and details, surveying, perspectives, etc.—A. E. P., 35, Carpenter Road, Edgbaston, Birmingham. 1189

ARCHITECT'S CLERK (22) seeks EMPLOYMENT. Good tracer; assist in surveying. 7 years' experience. Good ref.—C. L., 11, Herries Street, Queen's Park, London, W. 1165

ARCHITECT'S DRAUGHTSMAN wants SITUATION in office or works; eight years' experience; north preferred; 35s. salary.—Box 1164, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S JUNIOR ASSISTANT (22) requires ENGAGEMENT in London. Salary 25s. Working and detail drawings. Measuring old work. Knowledge of surveying, &c. Good references.—E. J. C., "Beaconsfield," Kew Green, Surrey. 1176

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BUILDER'S CLERK (26) requires SITUATION; estimating, quantities, drawing; moderate salary.—H. D., 3, Mildmay Road, Romford. 1169

BUILDER'S, &c. CLERK OF WORKS ASSISTANT (22); drawing, tracing, knowledge quantities and details; 4½ years in architect's office; certificates, building construction, advanced, 1st freehand, &c.—H. M. N., Thorncroft, Farnham, Surrey. 1187

CARPENTER and JOINER. Abstainer. Age 26; wants piecework; any distance; or take charge of shop (hand or machine) or as General Foreman or Manager on estate; have had experience in all above. —A. W., 6, Beaconsfield Road, Southall. 1155

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HOT WATER FITTER requires SITUATION; good references; has taken charge of work.—T. S., 70, Gordon Road, Ilford. 1179

IMPROVER requires ENGAGEMENT. 4½ years' experience. Good draughtsman, &c.; moderate salary.—Apply, H. LUCKMAN, St. Andrew's Road S., St. Anne's-on-the-Sea. 1174

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MACHINIST JOINER wants JOB. Good all-round hand. Well up with spindle and four-cutter. Town and country experience; take charge if required; good references; age 39.—Machinist, 54, Monson Road, Redhill, Surrey. 1157

MACHINIST wants SITUATION. Used to overhand and panel planer, saw bench, mortise, and deal frame. Good reference.—J. BURGESS, 11, Parker Street, Watford, Herts.

PLUMBER wants JOB or contract.— BILLIPS, 9, Sillwood Street, Rotherhithe, S.E. 1168

TIMEKEEPER and MATERIAL CLERK seeks RE-ENGAGEMENT. Highest references from large builders and railway contractors. Pay sheets, abstracts, &c. Age 33.—Address 29, Penn's Road, Petersfield, Hants. 1163

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SEE PAGES XV and XX FOR EMPLOYMENT REGISTER.

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See p. xx for the Employment Register.

To Contributors.

THE EDITOR will be pleased to consider any articles, illustrated or otherwise, dealing with old and new buildings, methods of construction, or other matter of an architectural character. He will also be glad to consider architectural photographs and sketches (the latter preferably in black and white) and measured drawings of work in this country or abroad. News items of interest to architects and builders will also be considered, provided the name and address of the sender are given; no notice will be taken of anonymous contributions. All communications should be addressed to the Editor of THE BUILDERS' JOURNAL, 6, Great New Street, E.C.

Contracts Open.

E. R.

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The Tenders are to be delivered at the War Office, Pall Mall, London, S.W., by TWELVE o'clock noon on 1st September, 1905.

War Office,
Pall Mall, S.W.
3rd June, 1905.

HERTFORDSHIRE COUNTY COUNCIL.

NEW PETTY SESSIONAL COURT AND TECHNICAL SCHOOL, CHESHUNT.

The Joint Committee for purposes of Police are prepared to receive TENDERS for the erection and completion of a new Petty Sessional Court and Technical School, Cheshunt.

Persons desirous of Tendering for the work may see the drawings, specification, agreement, &c., at the County Surveyor's Office, Hatfield, on and after Tuesday, June 13th, 1905, between the hours of TEN a.m. and FOUR p.m., except on Saturday, when they will be on view from TEN a.m. to ONE p.m.

A copy of the Schedule of Works and prices (quantities), and a form of Tender can be obtained at the County Surveyor's Office upon payment of Two Guineas, which sum will be returned to the tenderer upon receipt of a bonâ fide Tender and the documents which have been supplied to him.

Sealed Tenders endorsed "Tender for Petty Sessional Court, Cheshunt," must be delivered to the undersigned at his Offices, not later than 5 p.m., Monday, June 26th, 1905.

Such security for the due execution of the works as the Council may require must be given by the Contractor.

The lowest or any Tender will not necessarily be accepted.

URBAN A. SMITH,
County Surveyor.

County Surveyor's Offices,
Hatfield,
9th June, 1905.

Scale of Charges.

For Official Advertisements.

	Per Line s.	d.
Competitions, Contracts, all Notices issued by Corporate Bodies, Local and other Boards, Prospectuses of Public Companies, and Trade Paragraph Advertisements (minimum 4s. 6d.)	0	9
Partnerships, Apprenticeships, Land, Sales by Auction, Businesses, Trade and General Advertisements (minimum 2s.)	0	6

Appointments Wanted or Vacant.

	s.	d.
Four lines or under (about 30 words)	1	6
Each Additional Line (about 7 words)	0	6

THREE INSERTIONS FOR THE PRICE OF TWO.

Advertisements of this class must reach the Offices not later than 5 p.m. on Mondays.

6, Great New Street, Fetter Lane, E.C.

SUBSCRIPTION, POST FREE, 10/10 PER ANNUM,

or of any Newsagent or Bookstall, 2d. weekly.

Subscription Abroad, 17s. 4d. Post Free.

If you are not already a Subscriber, it will more than repay the small outlay to become one, and thus keep yourself posted in what is doing in the Architectural and Building World.

Privileges open to all Regular Readers of the "Builders' Journal."

I.—Free Monthly Advertisements.

1. A Free Advertisement of 12 words in the Wanted or Miscellaneous Advertisement Columns, in one issue of the BUILDERS' JOURNAL during each calendar month will be given to any regular reader.
2. The charge of one penny will be made for each additional word.
3. Advertiser's Name and Address or Box Number must be counted, but will in no case be reckoned as more than five words.
4. All advertisements must be accompanied by the correct remittance, and should a receipt be required a stamped addressed envelope must be enclosed.
5. The Proprietors reserve to themselves the right of refusing any advertisement.

II.—Free Answers to Enquiries.

1. The services of a large staff of experts are at the disposal of all regular readers who require information on architectural, constructional or legal matters.
2. Questions should in all cases be addressed to the Editor, and be written on one side of the paper only.
3. Correspondents are particularly requested to be as brief as possible.
4. The querist's name and address must always be given, not necessarily for publication.

Note.—Owing to the large number of enquiries we receive weekly, we are compelled to restrict the advantages of this department to Regular Readers.

III.—Free Accident Insurance of £500.

1. Every regular reader of the BUILDERS' JOURNAL is entitled to the benefit of this Insurance.
2. A Pamphlet giving full details of this and other Insurance schemes inaugurated by the BUILDERS' JOURNAL for the benefit of its readers, and guaranteed by "The Ocean Accident Corporation, Limited," will be sent on application.

What is a Regular Reader?

We have employed the term "Regular Reader" throughout these announcements as the description "subscriber" is often understood to mean one who subscribes direct to the publishing office.

We mean by a Regular Reader anyone who has placed an order with us or any newsagent or bookstall for the BUILDERS' JOURNAL for one year.

Those readers who order the BUILDERS' JOURNAL through their local newsagent or bookstall should send us the newsagent's receipt. Their names will then be placed on our subscribers' list, and they will be entitled to all the advantages set out above.

5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS.
OFFICE: 6, GREAT NEW STREET, FETTER LANE, E.C.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Alfreton.—For alterations and additions to the Wycliffe Congregational church and school. Mr. F. S. Antliff, architect and surveyor, Draycott, Derby:—

J. T. Brown	£1,700	0	0
Harris & Hunt	1,684	10	0
G. Wagg	1,674	19	0
Lee & Kirk,* Alfreton	1,660	0	0

* Accepted.

Bourne.—For the erection of fourteen houses in the Austerby. Mr. F. C. Shilcock, architect:—

G. Hawley, Buckminster	£2,395	0	0
H. Peake, Peterborough	2,000	0	0
Wyke & Sons, Peterborough	1,890	0	0
J. H. Clayton, Leicester	1,875	0	0
W. T. Walker, Old Leake	1,820	0	0
Hipwell & Co., Wisbech	1,755	10	0
Scotney & Co., Bourne	1,715	0	0
F. Johnson, Spalding	1,700	0	0
Cave, Scotney & Co., Bourne	1,680	0	0
Gelsthorpe & Sons, Bourne	1,540	0	0
Roberts Brothers,* Peterborough	1,410	9	9

* Accepted.

Bradford. — For the erection of a synagogue in Spring Gardens, Manningham Lane, for the Bradford Hebrew Congregation. Mr. B. S. Jacobs, architect, Lincoln's Inn Buildings, Bowlalley Lane, Hull:—

J. Totty	£3,408	0	0
Briggs Brothers	2,750	0	0
T. Obank & Son	2,726	0	0
C. Murgatroyd & Son	2,725	0	0
W. H. Hobroyd	2,671	0	0
G. Demain & Son	2,628	0	0
Toothill & Balmforth	2,603	10	0
E. Fearnley & Son	2,526	0	0
E. Good & Son, Ltd., Hull	2,526	0	0
J. Stead & Sons	2,522	0	0
T. Taylor & Sons	2,510	0	0
W. Farnish	2,500	0	0
W. Hargreaves	2,485	0	0
W. Newell	2,471	0	0
S. Wray & Co.	2,465	0	0
F. Shackleton	2,428	0	0
J. Moulson & Sons*	2,425	0	0

* Accepted. [Rest of Bradford.]

Bridgwater.—For the erection of free library. Mr. E. Godfrey Page, architect, 4 and 5, Warwick Court, Gray's Inn, W.C.:—

C. A. Hayes	£3,993	0	0
J. Perkins & Son	3,695	0	0
H. A. Forse & Sons	3,595	0	0
A. Poole	3,590	0	0
R. Wilkins & Sons	3,589	0	0
H. Flint	3,567	0	0
Gleed Brothers	3,526	0	0
H. Pittard & Sons	3,524	0	0
A. E. Donby & Co.	3,459	0	0
Collins & Godfrey	3,437	0	0
E. Love	3,353	0	0
T. Stockham	3,321	0	0
H. J. Spiller & Son	3,250	0	0
G. W. Pollard & Co.	3,217	12	8
J. E. Fursland	3,175	0	0
C. Taylor	3,100	0	0
C. Bryer, jun.,* Bridgwater	2,800	0	0

* Accepted.

Kensworth (near Dunstable).—For the erection of an infectious diseases hospital for twenty beds, for the Dunstable and District Hospital Joint Committee. Mr. George Simcox, architect, Town Hall, Dunstable:—

Saunders & Son, Luton	£4,865
T. Yirrell, Leighton Buzzard	4,775
Salisbury & Son, Harpenden	4,680
W. G. Dunham, Luton	4,640
Pitkin & Son	4,293
H. Goodman, Luton	4,180
A. Robinson	4,176
H. Higgs	4,100
C. Wright, Langford	3,888
A. W. Nash*	3,685

* Accepted. [Rest of Dunstable.]

Leyton.—For the erection of a free library in Lea Bridge Road. Messrs. J. T. Newman & Jacques, architects, 2, Fencourt, E.C.:—

J. Thomas	£4,595	0	0
Woollaston & Co.	4,575	0	0
Ferguson & Co.	4,272	0	0
S. E. Moss & Co.	4,250	0	0
W. Harris	4,200	0	0
Mattock & Parsons	4,189	0	0
J. T. Robey	4,159	0	0
F. W. Harris & Co., Ltd.	4,148	0	0
C. North	4,078	0	0
Oak Building Co.	4,057	0	0
Kirk and Randall	3,946	0	0
Shurmur & Sons	3,933	0	0
Sims & Woods	3,907	0	0
Gregar & Son	3,889	0	0
W. H. Hyde	3,871	0	0
Groves & Sons	3,819	0	0
A. Faulks	3,754	7	3
Sands & Burley	3,700	0	0
W. J. Maddison	3,698	0	0
H. C. Horswill	3,660	0	0
B. E. Nightingale	3,617	0	0
F. J. Coxhead	3,616	0	0
A. E. Symes	3,562	0	0
W. Manders	3,549	16	4
A. G. Crisp*	3,370	0	0

* Accepted.

London, W.—For the erection of a laundry at Strand-on-the-Green, Chiswick, for Messrs. Camille Simon, Ltd. Mr. Walter Hearn, architect, Burlington Court, Grove Park West, London, W. Quantities by Mr. C. E. Pease, 16, Clifford's Inn, Fleet Street, E.C.:—

A. J. Thompson & Co.	£7,309
A. & B. Hanson	6,955
G. Andrews & Co.	6,943
T. G. Minter	6,891
T. H. Adamson & Sons	6,875
J. Dorey & Co., Ltd.	6,699
Courtney & Fairbairn	6,403
Soole & Sons	6,400
Mattock & Parsons*	6,337

* Accepted.

Oldbury.—Accepted for the erection of a block of schools at Road End, for the Education Committee. Mr. A. Long, architect, New Street, West Bromwich Quantities by architect:—

M. Round, Dudley, Staffs	£5,750

Sketty (Swansea).—For the erection of ten pairs of villas, for the trustees of the Coedaeson Building Club. Mr. B. C. Deacon, architect, 20, Fisher Street, Swansea. Quantities by Mr. W. P. Horsburgh, Central Buildings, Liverpool:

Fuge & Rosser	£15,926	0	0
Brown & Backhouse	15,790	0	0
T. Richards	15,465	10	11
A. White & Sons	15,127	0	0
D. Jenkins	13,995	0	0
Lloyd Brothers	13,887	5	7
H. Billings	13,800	0	0
J. Marles & Sons	13,500	0	0
J. & F. Weaver	13,449	0	0
T. D. Jones	13,316	0	0
Hughes & Stirling	13,215	0	0
S. Fowler	12,600	0	0
W. Griffiths & Sons	12,500	0	0
J. Pye & Co.,* Morecambe	12,399	0	0

* Accepted subject to certain deductions.

Sketty (Swansea).—For the erection of seventeen houses in Town Hill Road, for the Sketty Co-operative Building Club. Mr. Charles T. Ruthen, architect, Bank Chambers, Heathfield Street, Swansea:—

Bennett Brothers	£9,000	0	0
T. Richards	7,762	0	0
Lloyd Brothers	7,613	9	11
J. & D. Jones	6,650	0	0
H. Billings	6,630	0	0
D. Jenkins	6,500	0	0
J. Marles & Sons	5,567	10	0
W. Evans	5,525	0	0
T. D. Jones	5,457	10	0
C. Marles,* Richardson Street	5,355	0	0

* Accepted. [All of Swansea.]

Sketty (Swansea).—For the erection of five pairs of semi-detached houses in Dillwyn Road, for the Second Sketty Co-operative Building Club. Mr. Charles T. Ruthen, architect, Bank Chambers, Heathfield Street, Swansea:—

D. Jenkins	£4,800	0	0
Fuge & Rosser	4,750	0	0
T. Richards	4,693	0	0
J. Marles & Sons,* Richardson Street Yard	4,075	0	0
T. D. Jones	3,999	15	0

* Accepted. [All of Swansea.]

Witherley (Leics.).—Accepted for the restoration of interior of walls to nave of Witherley Church. Mr. J. Frank J. Goodacre, architect, Berridge Street Chambers, Berridge Street, Leicester:—

T. Slack, builder, Witherley	£97	10	0

Woodford (Essex).—Accepted for the erection of a detached house. Mr. H. Riches, architect, 3, Crooked Lane, King William Street, London, E.C.:—

T. Osborn & Sons	£1,268

Ynismeudw.—For the erection of nineteen houses, for the Swansea Valley Building Club. Mr. Charles T. Ruthen, architect, Bank Chambers, Heathfield Street, Swansea:—

Thomas Brothers, Pontardawe	£5,662
L. S. Owen & Co., St. Thomas, Swansea	5,605
W. Morgan, Ystalyfera	5,510
Mills & Powell, Pontardawe	4,940
W. J. Griffiths, Pontardawe	4,769
J. R. Williams,* Ystalyfera, R.S.O.	4,712

* Accepted.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending June 16th nineteen failures in the building and timber trades in England and Wales were gazetted.

J. C. CREE, builder, Ilford. R.O. June 5th.

G. HARBER, builder, East Ham. R.O. June 9th.

S. WOOLFF, builder, Hackney. Adj. June 6th.

W. ELSDON, builder, Clapham Park. R.O. June 8th.

R. BROWNLEY, joiner and builder, Chorley. R.O. June 8th.

H. J. SHEPPARD, builder, Cheltenham. Gross liabilities £3,640; deficiency £528.

W. H. BELCHER, brick merchant, Paddington. Gross liabilities £57,010; £7,306 expected to rank for dividend; assets £8,289.

J. ATKINSON, quarryowner, Colne. First meeting, O.R.'s, Preston, June 22nd, at 11.30. P.E., Burnley C.C., June 30th, at 10.45.

J. HARLEY & SON, builders, Smethwick. First meeting, 191, Corporation Street, Birmingham, June 22nd, at 2. P.E., West Bromwich C.C., July 13th, at 10.30.

W. GUEST & SON, painters and plumbers, Dudley. R.O. June 6th. First meeting, O.R.'s, Dudley, June 21st, at 11. P.E., Dudley C.C., June 28th, at 11.

P. BARBER, architect and surveyor, Harrogate. R.O. June 8th. First meeting, O.R.'s, York, June 23rd, at 2.30. P.E., York Courts of Justice, July 7th, at 11.

W. CHEESEMAN, builder and contractor, Hull. First meeting, O.R.'s, Hull, June 21st, at 12. P.E., Hull C.C., June 26th, at 2.

W. S. HILDRED, builder and slater, Hull. First meeting, O.R.'s, Hull, June 22nd, at 11. P.E., Hull C.C., June 26th, at 2.

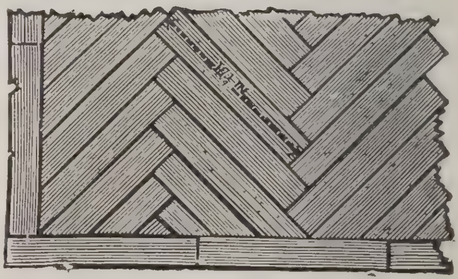
ROOFING SLATES:
Velinheli, Penrhyn, and Westmoreland.
SLATE SLAB GOODS:
Both Plain and Enamelled.
ALFRED CARTER & CO., LIVERPOOL.

BLUE and
FERRO-GALLIC PRINTS
White line on blue ground, and dark line on white ground
Drawings Enlarged and Reduced by a new process at very reasonable prices.
W. F. STANLEY & Co., Limited,
13, Railway Approach, London Bridge, S.E.
NEW REVISED PRICE LIST POST FREE.
All Prints by Electric Light, no extra charge.
Tel. Ad.: "TRIBRACH, LONDON." Tel. No. 871 Hop.

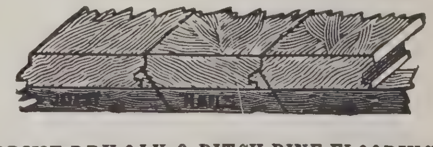
FOR
BLIND LATHS
GO TO
R. BELL & Co. LTD. BROMLEY-BY-BOW.
Estbd ◆ LONDON ◆ 1832

MOSAIC
MANUFACTURING Co
18 & 20 KINGS ROAD
ST. PANCRAS LONDON N.W.
MOSAIC · PARQUET · WOOD · BLOCK
LEADED LIGHTS · WALL · TILING

FLOORING BLOCKS



Per 100 Blocks out of sizes.	YELLOW.		PITCHPINE.
	At Wharf.	ex Ship within one Month.	At Wharf.
17¼ × 3 × 3	12 9	12 0	16 6
17¼ × 3 × 2	8 3	7 9	11 5
17¼ × 3 × 1½	6 9	6 3	9 0



PRIME DRY OAK & PITCH PINE FLOORINGS
With Special Joint to conceal Nails—
1¼ × 4 Oak, 56/9 Pitch Pine 27/- per square.
1 × 4 " 45/- " 22/9 "
These prices do not include desiccation.
VIGERS BROTHERS,
TIMBER MERCHANTS,
Only Address—67, KING WILLIAM STREET, E.C.
Telephone Nos. 601 and 602 Avenue.

PAVING FLAGS, BRICKS, SLATES, &c.

GIBBS BROTHERS,
LOUGHBOROUGH,
MANUFACTURERS OF
MOUNTSORREL CONCRETE PAVING FLAGS, WINDOW HEADS, SILLS, KERBS GUTTERS, &c. ALSO OF
SUPERIOR SAND-FACED BRICKS.
BEST RED FACINGS.
SLATE MERCHANTS.
SLATING AND TILING CONTRACTORS.
Stocks of Velinheli, Bangor, Portmadoc, on hand.

LIGHT & DARK SEA GREEN STONE, MOTTLED GREEN STONE,
For Mullions, Sills, Heads, Quoins, Jambs, Fenders, &c.

Buttermere Green Slate and Stone Works,
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INSURANCE CO., LTD.
Head Office: 49, Queen Victoria Street, E.C.
Ten per cent. of the Premiums returned every six years in cases where no claim has arisen.
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BIRKBECK BANK
ESTABLISHED 1851.
Current Accounts. 2 % Interest allowed on minimum monthly balances when not drawn below £100.
Deposits. 2½ % Interest allowed on Deposit Accounts.
Advances made. *Stocks and Shares* bought and sold.
Apply Secretary,
Southampton Buildings, High Holborn, W.C.

STONE OF ALL DESCRIPTIONS.
ROBIN-HOOD, HOWLEY PARK, ACKWORTH, AND OTHER YORK STONES. HOPTON-WOOD, DARLEY-DALE, STANTON, AND ALL DERBYSHIRE STONES.
HOLLINGTON, ANCASTER, CORSEHILL, DUMFRIES, ST. BEES, &c.
In the rough, sawn, or worked ready for fixing.
BATH STONE DIRECT FROM THE BATH STONE FIRMS, LTD. AT THEIR PRICES.
Speciality: FINEST HARD BLUE & BROWN STONE AT VERY LOW PRICES.
Please send your enquiries and orders to
J. HODSON & SON, Ltd.,
Quarry Owners and General Stone Merchants.
Head Office Postal Address: NOTTINGHAM.

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PATENT TUBULAR,
GUARANTEED
ABSOLUTELY
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SANKEY'S
Fire Bricks, Fire Clays, Fire Cements.
BEST QUALITIES. LARGEST STOCK. Also GANISTER, &c.
The best methods for setting GALLOWAY, CORNISH, LANCASHIRE, &c., BOILERS.

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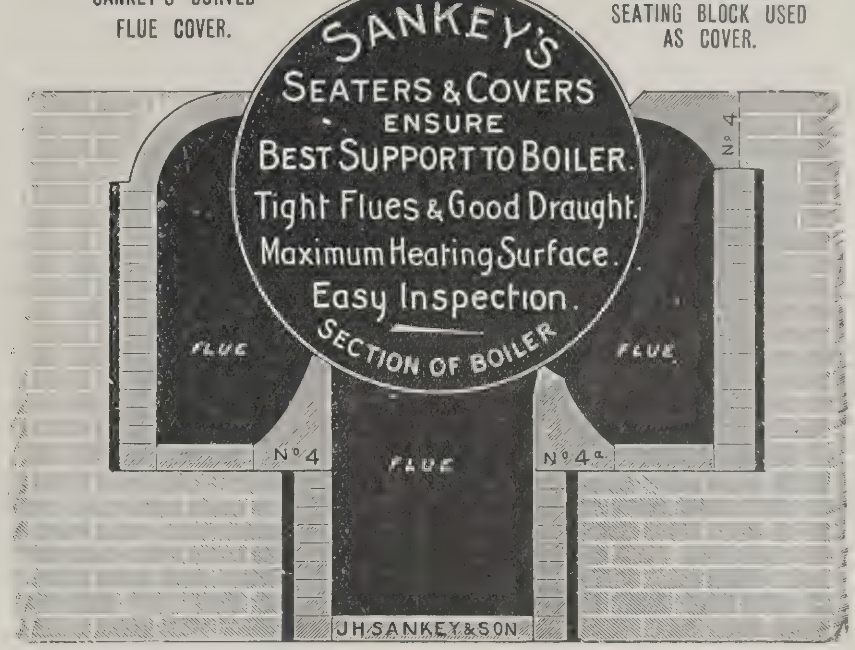
SANKEY'S BOILER SEATING BLOCK USED AS COVER.



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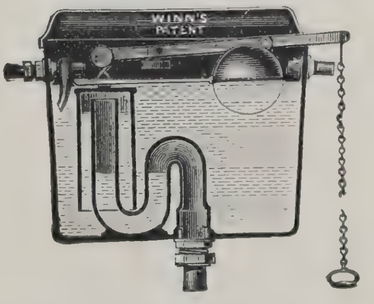
J. H. SANKEY & SON, LTD.,
ESSEX WHARF, CANNING TOWN, E.
Contractors to H.M. Government,
Write for New Catalogues.

B. WARD & Co., Ltd.
38 & 39, PARLIAMENT STREET, WESTMINSTER, S.W.
Concrete, Mosaic, and Wood Block Paving Specialists.
(*See displayed Advt. in issue for June* 14, *p.* ii.)

STANLEY BROS., LTD., NUNEATON.
. . . MANUFACTURERS OF . . .
WHITE AND COLOURED GLAZED BRICKS,
GLAZED SOCKET PIPES, RED AND BUFF CHIMNEY POTS
Semi-Encaustic Paving Tiles,
ORNAMENTAL RIDGES AND FINIALS,
Staffordshire Quarries, Roofing Tiles, &c.

WINN'S PATENT ACME
SYPHON CISTERN



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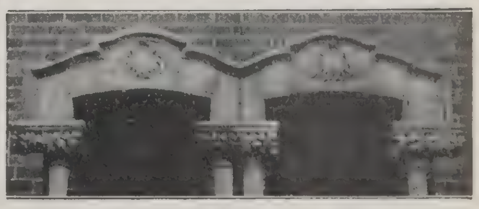
List Price, as drawn, 18s.; Galvanised, 25s.
CHARLES WINN & Co. BIRMINGHAM



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WALWYN T. CHAPMAN,
Terra Cotta Works,
CLEETHORPES,
FOR
New Catalogue of
WINDOW and DOOR HEADS,
TRUSSES, CORBELS, FINIALS,
CHIMNEY POTS, VASES,
MOULDED BRICKS, &c.

Current Market Prices

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0	1	13	0
Clover, best	per load	3	15	0	4	2	6
Hay, good	do.	3	10	0	3	15	0
Sainfoin mixture ...	do.	3	10	0	3	17	6
Straw	do.	1	12	0	2	0	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ...	per cwt.	1	0	5		—	
Colza Oil, English ...	do.	1	3	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0		—	
Linseed Oil, barrels ...	per cwt.	1	0	4½		—	
Petroleum, American ...	per gal.	0	0	5¼		—	
Do. Russian ...	do.	0	0	4⅞		—	
Pitch	per barrel	0	8	0		—	
Shellac, orange	per cwt.	6	17	6		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	4	0	1	4	6
Tar, Stockholm	per barrel	1	6	6		—	
Turpentine	per cwt.	2	17	0		—	

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ...	per ton	80	0	0		—	
Iron, Staffs., bar ...	do.	5	15	0	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	12	6		—	
Lead, pig, Soft Foreign...	do.	13	0	0		—	
Do. do. English common brands	do.	13	5	0		—	
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14	0	0		—	
Do. pipe	do.	15	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	5	0		—	
Do. floor brads... ...	do.	9	0	0		—	
Steel, Staffs., Girders and Angles	do.	5	7	6	5	12	6
Do. do. Mild bars ...	do.	6	0	0	6	5	0
Tin, Foreign	do.	138	10	0	139	0	0
Do. English ingots ...	do.	139	0	0	141	0	0
Zinc, sheets, Silesian ...	do.	26	10	0		—	
Do. do. Vielle Montaigne	do.	26	12	6		—	
Do. Spelter	do.	24	5	0	24	10	0

TIMBER.

Soft Woods.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel	per load	2	10	0	4	15	0
Pine, Quebec, Yellow ...	do.	4	0	0	7	10	0
Do. Pitch, American	do.	2	8	0	5	0	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, Kemi Yellow, 1st & 2nd, 4×11	per std.	11	0	0		—	
Do. do. do. do. 3×9	do.	10	5	0		—	
Do. do. do. do. 2×9	do.	10	15	0		—	
Do. Soderhamn, Yellow, 4th, 4×9	do.	11	15	0		—	
Do. St. Petersburg, Yellow, 1st, 3×11	do.	16	10	0		—	
Do. Kem, Yellow, 1st, 3×9	do.	18	10	0		—	
Do. Nederkalix, Yellow, 1st, 3×9	do.	11	15	0		—	
Do. Umba, Yellow, 4th, 3×9	do.	8	10	0		—	
Do. Gefle, Yellow, 3rd, 3×9	do.	11	10	0		—	
Do. Sandarne, Yellow, 5th, 2½×7	do.	8	10	0		—	
Do. Quebecand Saguenay, Spruce, 3rd, 3×9	do.	8	15	0		—	
Do. St. John, Spruce, 1st, 2nd & 3rd, unsorted ...	do.	7	10	0		—	
Battens, all kinds ...	do.	6	0	0	13	0	0
Flooring Boards 1in. prepared, 1st... ...	per square	0	10	6		—	
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Do. Honduras ...	do.	0	0	3½		—	
Do. Tobasco	do.	0	0	3¾		—	
Elm, Quebec	per load	4	0	0	8	10	0
Jarrah, planks	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras...	per ft. sup.	0	0	3 1/32		—	
Do. Tobasco ...	do.	0	0	4 27/32		—	
Do. Cuba ...	do.	0	0	2 27/32		—	
Do. African ...	do.	0	0	2 29/32		—	
Oak, Wainscot	per log.	3	5	0	7	5	0
Teak, Indian, logs ...	per load	10	0	0	18	15	0
Do. do. planks ...	do.	13	0	0	20	5	0
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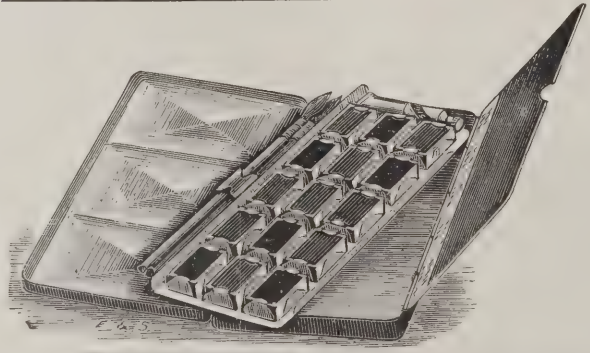

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THE BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

June 28, 1905. Vol. 21, No. 542. 6, Great New Street, Fetter Lane, E.C

Summary.

Mr. Edwin T. Hall thinks that the best position for a sanatorium is the southern slope of a gentle hill and near its summit, with tree shelter on its north, east and west. The subsoil should be sand or gravel. (Page 366.)

There is a sufficient thickness of gravel underlying the peat on which Winchester Cathedral was raised to enable the east end to be underpinned and repair the alarming subsidence of the south side that has occurred. (Page 364.)

For more than thirty years concrete houses have been built in Germany, but the condensation of moisture on the walls has resulted in bringing them into disfavour. Not only is the use of wallpapers or other hangings made impossible (streams of water being visible—even on distempered walls—when gas is lighted or when several people are in a room) but dampness in buildings is one of the most potent sources of ill-health. (Page 354.)

In the opinion of Mr. Charles W. Russell, the eminent American architect, the sky-scraper has come to stay, and he suggests that a solution of the difficult problem of treating architecturally a flat wall pierced with windows at equal intervals might be obtained by the application of coloured materials, omitting large projections, but with a handsome sky-line. (Page 358.)

An elaborate series of experiments have been carried out by Professor Lilly in order to determine a reliable formula for the calculation of the strength of columns, but for the present he is of the opinion that it is better to use the well-known Rankine-Gordon formula until more experimental data have been obtained. (Page 359.)

Mr. D. M. Row advocates the low-pressure hot-water system of heating in which temperature is secured and maintained by calorifiers through which the water constantly circulates as the only one affording an absolutely good and healthy atmosphere for breathing purposes. (Page 366.)

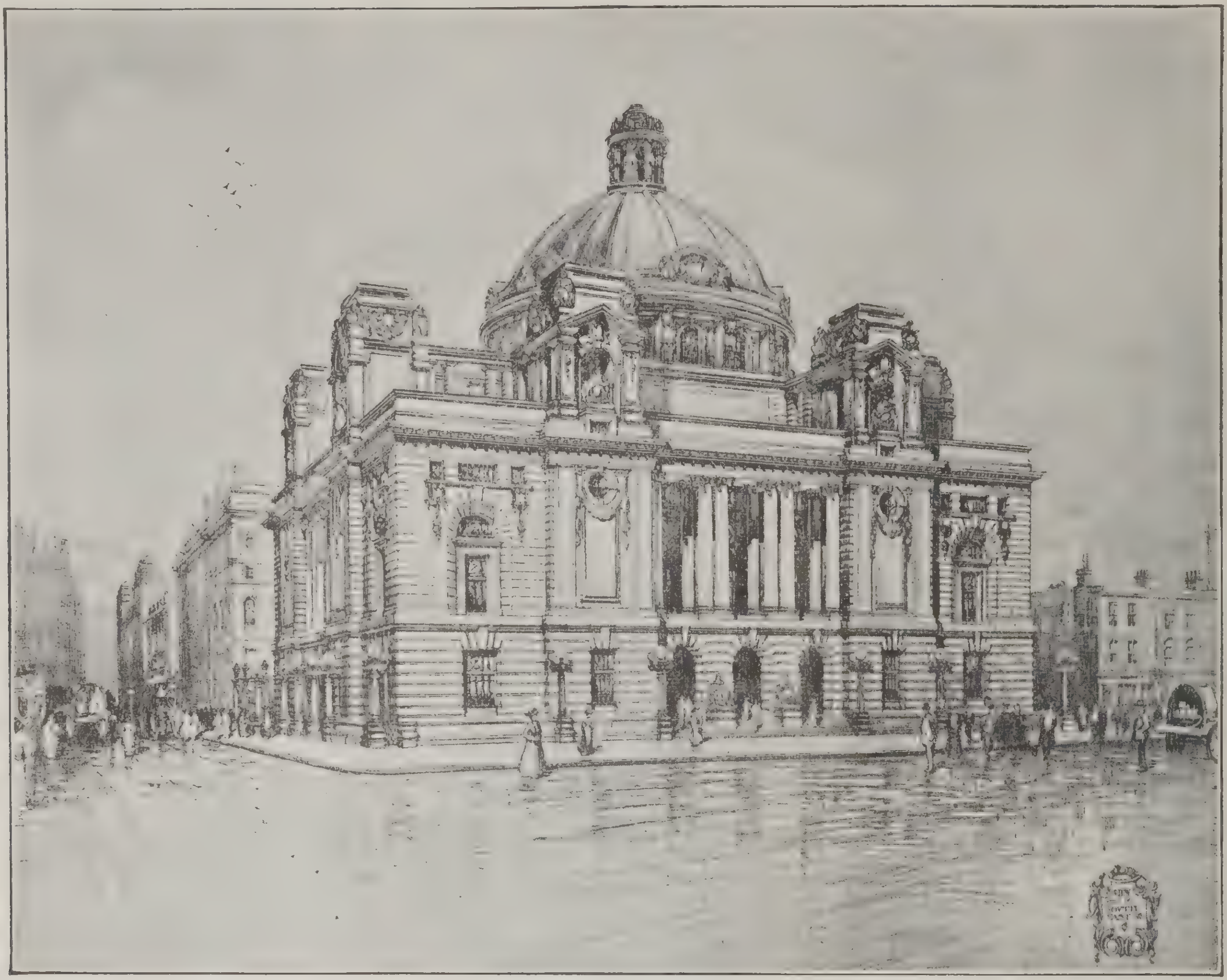
Models of buildings are generally made of wood, yellow pine being principally used, as it is easiest to work, and with the aid of a circular saw the angles and joints can be fixed and set up perfectly true. (Page 365.)

In all systems of heating by radiators the walls of a room are cooler than the air, and consequently become rapidly covered with dust and dirt. An open fire, on the other hand, warms the walls, and therefore does not cause the walls to become so dirty. The repulsion of dust from a warmer to a cooler surface is seen on plastered partitions and ceilings where the lines of timber framing or joists are shown by the dust collected between on the cooler plaster. (Page 357).

Preserving London Antiquities. Mr. Emslie J. Horniman, late Chairman of the London County Council Historical Records and Library Sub-Committee, has written to the "Times" in reference to the agitation for a museum for preserving some of the features of London which would otherwise disappear. The Guildhall Museum, it is true, preserves a number of interesting objects, but it is crowded. A number of the free libraries also have interesting collections of prints, books, &c. Mr. Horniman states that when the new County Hall is built proper accommodation will, no doubt, be provided for a museum such as is suggested, and that the London County Council have already accumulated a number of objects which would form an interesting collection. There is stored away at the present moment a good deal of carved woodwork, balusters, chimney-pieces, plaster ceilings and cornices, lead cisterns, ironwork, &c., preserved at the mere cost of removal. At Spring Gardens there is also a good collection of prints, maps, books, &c., dealing with London topography, besides many records and Court rolls. Not only are all objects preserved that can be, but drawings and photographs are taken of everything of interest before houses are pulled down by the Council, and as far as possible the same is done for buildings belonging to private owners, and a record kept of any archæological discovery.

Sketching. The present season is one of holidays, when much sketching is done. Students are too often inclined to sketch any detail that strikes their fancy without any thought as to the possible utility of the record afterwards. Of course the study of the picturesque and the beautiful is of advantage as a training up to a certain point, but an architect's aim is a different one from that of the painter, and it is open to doubt whether considerable skill in draughtsmanship is an advantage to the architect. It is certain that in the past the designers of great monuments of architecture had very little ability in this direction, and in the times of the Renaissance there were eminent painter-architects whose work more often than not suffered from their facility in draughtsmanship which led them to excesses in the direction of perpetrating features which were not constructive. We see the same tendency nowadays in the productions of the L'Art Nouveau School, when curved forms are employed to obtain picturesque effects, contrary to the functions of the building, the materials and constructive science. An architect's sketches should record the constructive means by which any particular effect is obtained, and should not have pictorial value only. Far too often sketches are made of portions of old buildings which are afterwards copied into buildings where they lose all their charm from the fact that they lose their association and logical fitness. The student should study in all its bearings any piece of work that he desires to sketch; that is, he should study the site, the conditions which led to the adoption of its plan or form and its relation to the rest of the building or to its surroundings; the construction from the historical standpoint of the training and knowledge of the builders and the means at their disposal; the features of design which betray tradition, seeking out the sources of these as a collateral study; the materials, and from where they were obtained, their uses and the effect of the weather. It would be better to study one building thoroughly and never get further than one sketch (indeed, never produce one at all) than make a large number of sketches unintelligently. The knowledge gained of construction and architectural design is the thing. In short, what should be studied is the evolution of the building.

King's College Hospital: A Criticism. Readers of the "Hospital" will have noticed the very well-informed criticisms of hospital designs which appear from time to time in its pages. In the issue for June 17th there is one in reference to the King's College Hospital Competition which we think is of sufficient general interest to quote. Our contemporary says: "It would be easy to criticize in detail Mr. Pite's plan as well as, for the matter of that, all the rest of the plans; but it must be admitted that the competitors had an almost impossible task set them in trying to plan the whole of the vast accommodation required on an inadequate site. Mr. Pite has produced a plan which in our judgment has only one serious competitor in Messrs. Douglas & Paterson; but if the work is to be carried through the whole scheme ought to be entirely remodelled, and either the accommodation reduced or more land acquired. Probably the latter alternative is the right one; and we believe the question of acquiring a separate site for the out-patient department has already been before the Removal Committee. With the out-patient department removed to another site the administration block could be remodelled and the narrow interior courts, which could never receive sufficient light and air, could be either omitted altogether or so remodelled as to be unobjectionable; more suitable sites could be found for the students' hostel and the houses for the medical superintendent and secretary than the edge of the slope of a deep railway cutting."



DESIGN FOR WESLEYAN HALL AND CONNEXIONAL OFFICES, WESTMINSTER. BY C. E. MALLOWS AND A. W. S. CROSS.

DAMPNESS OF CONCRETE STRUCTURES.

CONCRETE is not impervious to water, as often supposed, though trowelling of the face, so as bring the cement to the surface, will do much to keep out water. It is, however, little appreciated how absorptive the material is of moisture and how it condenses moisture from the air. This latter is one of the great objections to concrete houses and has prevented their wide adoption. For more than thirty years concrete houses have been built in Germany, but the condensation of moisture on the walls has resulted in bringing them into disfavour. Not only is the use of wallpapers or other hangings made impossible (streams of water being visible—even on distempered walls—when gas is lighted or when several people are in a room) but dampness in buildings is one of the most potent sources of ill-health.

With a solid concrete wall there is not much to be done, but the hollow concrete block is claimed to overcome the difficulty. It is not clear that either brick or stone is impervious to moisture: consequently special precautions are taken to exclude dampness; but most makers of concrete blocks assert that the hollow space in the blocks attracts, by the process of capillarity, such moisture as is absorbed by the block, or that the air in the space dries the moisture before it can penetrate into the interior. They depend entirely upon the hollow space to exclude moisture. We shall deal with this fallacy later, but first we will consider the waterproofing of concrete as ordinarily understood.

Effect on Stability.

From the point of view of stability it is important to waterproof concrete. In ordinary building construction sufficient attention is not given to the waterproofing of concrete foundation walls. Buildings are often to be seen constructed in a clay subsoil and the cellar and lower foundation walls put in without any attempt being made to apply a damp-proof course or vertical damp proofing, or to supply suitable drainage to carry off the ground water.

Soakage of Water.

In both masonry and concrete structures where there is any danger of soakage of water the waterproofing will probably extend the life of the structure. A recent examination of concrete abutments, retaining walls, &c., built some years ago, disclosed the fact that water was soaking through the mass in several places, particularly along the parting planes where the work was not carried on continuously. This condition is frequently observed in concrete construction, and can be entirely prevented if the back of the structure is thoroughly waterproofed with bitumen.

It is now the practice on a number of American railroads to thoroughly waterproof all arches, abutments, retaining walls, &c. The method generally employed is to use as a first coat bitumen diluted with naphtha, applied as a paint to the concrete after the mass is perfectly dry, and then to cover the surface with a bituminous mastic composed of 1 part of bitumen to 4 of sand; this to be smoothed off with hot smoothing irons and thoroughly tamped and pressed into place. If the filling over the arch is ordinary gravel or dirt, no other work will be necessary, but if it is filled with broken stone or stone chips it is better to cover the surface of the bitumen with washed roofing gravel so that the broken stone may not cut or damage the bitumen surface.

There are various other methods employed in waterproofing concrete surfaces with bitumen, such as the use of felt impregnated with and embedded in the bitumen. Another form is a thin sheet of lead between bitumenized sheets of felt, the latter to protect the former. It is very difficult to make hot bitumen adhere to a concrete surface, however dry the same may be, unless it is heated by artificial means. Hot bitumen laid on ordinary dry concrete will not adhere, and can be rolled up like a rug after it has cooled. Some success may be obtained by applying hot bitumen direct to concrete surfaces after the same have been dried and heated with hot sand, but the use of bitumen diluted with naphtha applied as a painting or swabbing coat is preferable. It does not require any special expert knowledge of its application.

For metallic structures exposed to the direct rays of the sun the bitumen should not flow under 212 degs. Fahr., and should not become brittle at 15 degs. Fahr. below zero when spread thin on glass. For stone, brick or concrete structures underground, such as arches, abutments, retaining walls, foundation walls of buildings, subways, &c., a flow point of 185 degs. Fahr. and a brittle point of zero Fahr. will be required. The bitumen covering should not perceptibly indent when at a temperature of 130 degs. Fahr. under a load at the rate of 15 lbs. per sq. in.; and it should remain ductile at a temperature of 15 degs. Fahr. below zero on metal structures and at zero Fahr. on stone, brick or concrete structures under ground.

Applying the Bitumen.

Before applying bitumen to a metal surface it is imperative that the metal be cleaned of all rust, loose scale and dirt; and if previously coated with oil this must be burned off with benzine or by other suitable means. The metal surface must be warm to cause the bitumen to stick to it, and the warming is best accomplished by covering it with heated sand, which should be swept back as the hot bitumen is applied. When waterproofing masonry or concrete structures, if the surface cannot be made dry and warm it should be first coated with a bitumen paint made of bitumen diluted with naphtha. This is particularly necessary for vertical surfaces.

The bitumen should be heated in a suitable kettle to a temperature not exceeding 450 degs. Fahr. If this is exceeded it may result in "pitching" the asphalt. Before the "pitching" point is reached the vapour from the kettle is of a bluish tinge, which changes to a yellowish tinge after the danger point is passed. If this occurs the material should be tempered by the addition of fresh bitumen. The bitumen has been cooked sufficiently when a piece of wood can be put in and withdrawn without the bitumen clinging to it.

The first coat should consist of a thin layer poured from buckets on the prepared surface and thoroughly mopped over. The second coat should consist of a mixture of clean sand or screenings, free from earthy admixture, previously heated and dried, the mixture being in the proportion of 1 of bitumen to 3 or 4 of sand or screenings by volume; this should be thoroughly mixed in the kettle and then spread out on the surface with warm smoothing irons, such as are used in laying asphalt streets. The finishing coat should consist of pure hot bitumen spread thinly and evenly over the entire surface, and then sprinkled with washed fine gravel, sand or stone screenings, to harden the top. The thickness of the coating will depend on the character of the work, and may vary from ¾in. to 2ins.

Bitumen Concrete.

Where a quantity of bituminous concrete is required, such as in steel trough floors on bridges, a concrete should be made in the proportion of 1 part bitumen, 2 parts sand and 3 parts limestone screenings, thoroughly mixed and rammed into place with tamping irons on the first coat of pure bitumen with which the metal was originally covered. At all drainage holes large-sized stones should be carefully packed by hand to ensure perfect drainage.

It may not be out of place in discussing the question of waterproofing to call attention to the necessity for provisions for drainage in all concrete and masonry structures. This has not been given as much attention as it should receive. Whether waterproofing material is applied or not, the question of thoroughly draining the structure is of the greatest importance.

Why Concrete Blocks are Damp.

The reasons why a building of concrete blocks is damp are:—

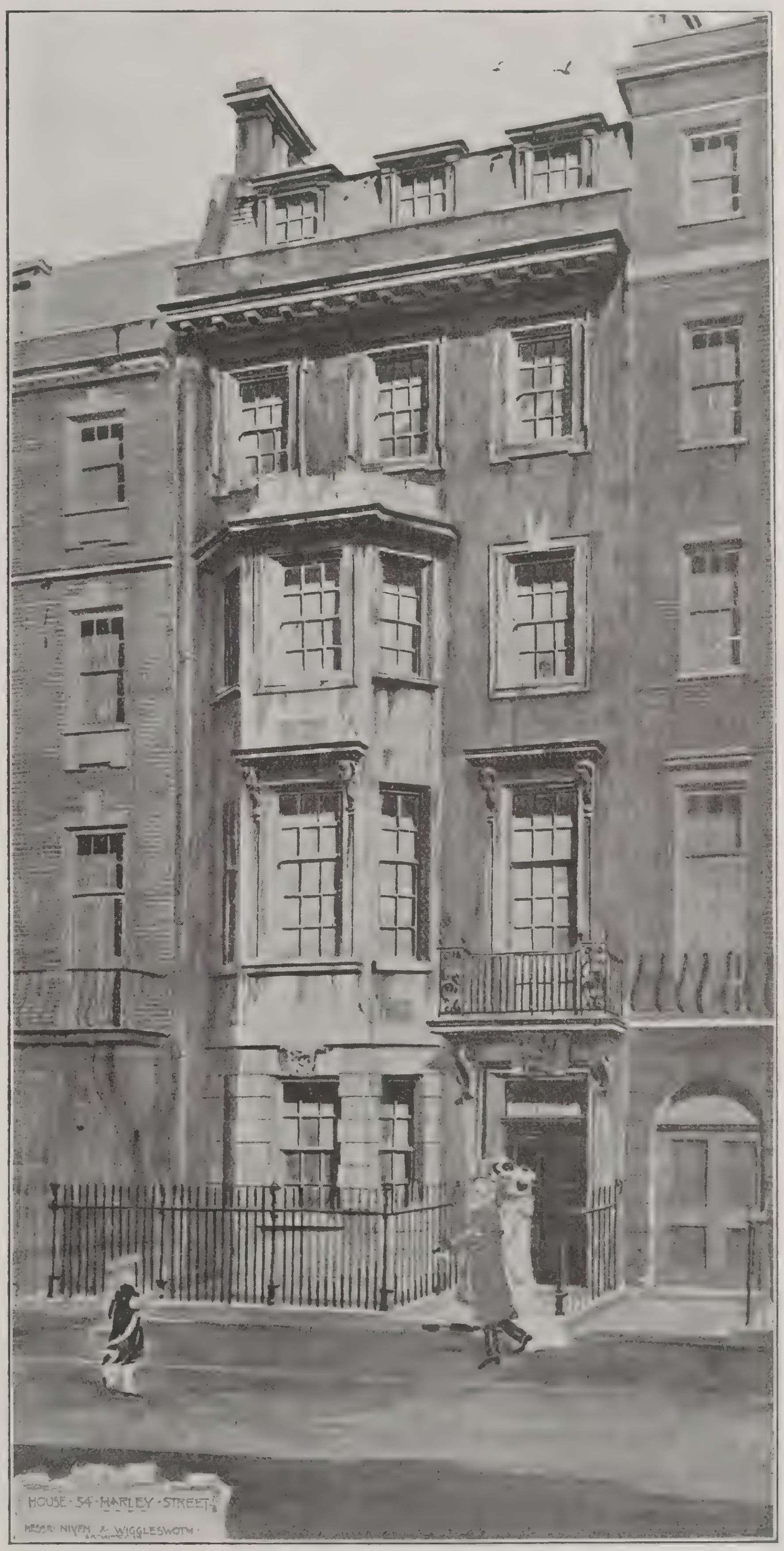
(1) Concrete, whether rich in cement or compressed by hydraulic pressure, will absorb more or less moisture. The porosity is not eliminated but merely diminished.

(2) The hollow space, not being continuous, does not prove a barrier to the penetration of moisture, as it will travel through the solid portions of the block. With the exception of those blocks in which there are double air spaces, the hollow space does not entirely isolate the inner from the outer face of the block. Double air spaces accomplish this, but a single air space in order to do so must run from end to end, which means practically erecting two walls and creating a continuous air space between them. This system of erecting parallel walls has been for the most part abandoned, because a given amount of material will not produce as strong a building as when it is used in the form of hollow blocks.

(3) Air in the hollow space is not dry air, but, on the contrary, becomes damp in a short time, thus destroying whatever efficacy the air space might have. The theory is that dry air confined will not conduct heat or cold. On the other hand, if the air is damp it will conduct readily. From this it must be deduced that the single air space in a block is of little value as an insulator because it fails to completely exclude moisture. The double air space in a cement block may prevent dampness resulting from direct penetration, but as an insulator it fails because the air contained in the spaces becomes damp and consequently conducts heavily. If moisture is attracted to the hollow space by the process of capillarity, then damp air is the result.

Condensation.

Dampness in buildings results either from direct penetration of moisture through porous bodies, caused by rain beating on the outer face of the wall, or from the walls absorbing atmospheric moisture, or from warm air striking the cold wall and condensing. Water is always present in the



This house, for a doctor, has been carried out in Portland stone by Messrs. Prestige & Co., builders, London, to the design of Messrs. Niven & Wigglesworth, architects. The drawing is exhibited at this year's Academy.

atmosphere. Water is soluble in air, and when dissolved in it is as invisible as the air itself. When the proportion of water is greater than the air can dissolve, the atmosphere is said to be damp; when the air can dissolve all the water the atmosphere is called dry, notwithstanding that it still contains water. The proportion of water soluble in air increases with the temperature of the air. When air nearly saturated with water is cooled, some of the water is precipitated. During the heat of a warm day the atmosphere may be clear, bright and apparently dry, although it may contain as much water as the air is capable of dissolving at that period. Whenever such air is cooled, as, for instance, at sunset, it becomes unable to hold as much water as during the heat of day, and some of the water is discharged, becoming dew, mist, or even rain, according to the degree and rapidity of the cooling process.

Tests.

Tests have shown that the water absorbed in five hours by six different blocks amounted to so much that the penetration of moisture to the inner face of the block was a certainty. The conclusion from these tests was that some method of waterproofing was a necessity. The tests demonstrated the fact that the hollow space in the block merely minimizes the amount of dampness without excluding it absolutely. The opinion has been expressed that making impervious blocks by the addition of sand is almost an impossibility for many reasons, one of which is that no positive formula can be given owing to the different sands and aggregates and different fineness of cements requiring different proportions, from which we must conclude that ideal conditions are required which are almost impossible to obtain.

To make the Blocks Impervious.

To insulate and damp-proof a building constructed of concrete blocks they should be made impervious to moisture. If this is done, not only is moisture prevented from entering a block but the air contained in the cells of the block is protected against pressure from the outside. Thus the block is constantly filled with air confined in small cells, which is acknowledged to be an excellent non-conductor; consequently, the insulating power of cement and sand mixed in the form of concrete is maintained at its highest point of efficiency, and, assisted by an air space containing dry air, a building easily kept cool in summer and warm in winter must result.

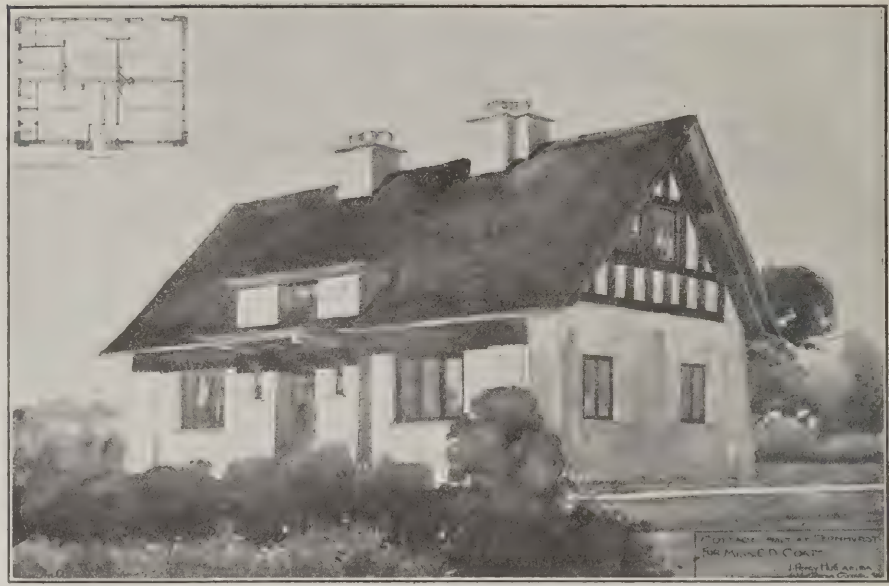
The simplest method would seem to be to apply a waterproofing liquid that will fill the pores of the stone and render them impervious to moisture. At the same time it must neither injure the ingredients of the block or discolour the surface. It must not be affected by frost nor be drawn to the surface and evaporated by the heat of the sun. Various chemical compounds have been recommended and are being used by makers of concrete blocks, but in applying a waterproof coat care must be taken not to affect the strength of or otherwise injure the block.

A process that has been adopted is to make the concrete blocks with alum water and a solution of Castile soap in water, but this process is held in disfavour.

The only material that is insoluble in water that will resist chemical action and at the same time will not injuriously affect concrete is paraffin. The chief drawback to paraffin is that it requires mechanical means to apply which would so increase the expense of blockmaking as to be practically prohibited.

The problem still awaits solution.

A new Institute for St. David's, Exeter, is being erected from designs by Mr. Harbottle Reed, architect, of Exeter. Messrs. Ham & Passmore are the contractors.

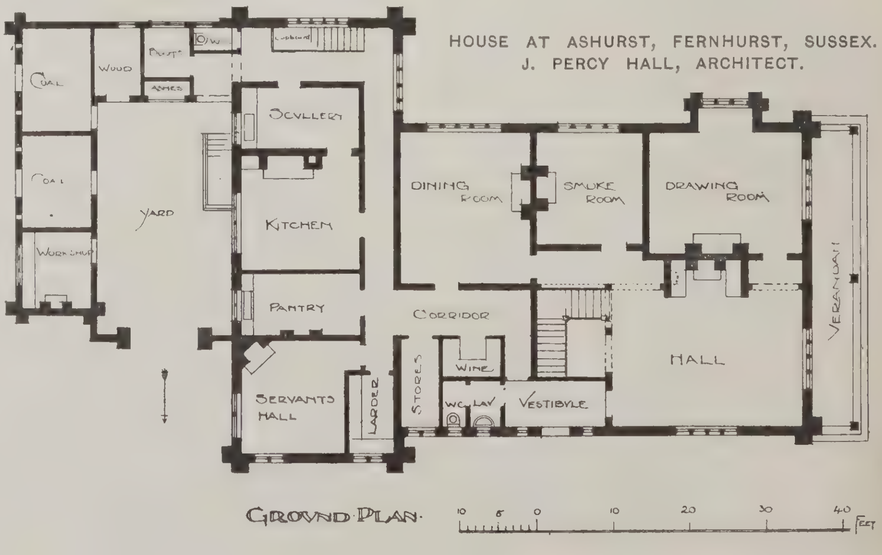


OUR PLATES.

ASHURST HOUSE has recently been built for Miss E. D. Coats at Fernhurst, Sussex. The building is of brick covered with rough-cast. The ground-floor windows have plain stone dressings, the upper portion being half-timbered. The roofs are covered with red tiles, and the whole of the woodwork, except half-timbering, is painted a green colour. Internally the house is treated in a simple manner, with the exception of the hall and staircase, which are in oak; the walls and ceilings being finished in square framed-panelling and the floor laid with narrow oak boards. The vestibule is also panelled in oak to a height of 6ft. 6ins. A complete electric-lighting plant has been installed, the accumulators being of sufficient capacity to supply both house and stables for about a week under ordinary conditions without necessitating the running of the dynamo. The engine-house is situated out of view about halfway between the house and stables. The automatic motor-driven pump, which supplies the main tanks of both house and stables, is also fixed here, the source of supply being a deep well some little distance away. Telephones and bells have been installed throughout. The whole of the work, including the hydraulic portion, has been carried out by Messrs. A. V. Gifkins & Co., 68, Victoria Street, S.W. The general contractors for house and stables were Messrs. W. Pattinson & Sons, 50, Parliament Street, S.W., and Ruskington, Lincs., and the architect was Mr. J. Percy Hall, A.R.I.B.A., of 6, Victoria Grove, Kensington. The cottage illustrated on this page contains the laundry on the ground floor, and is built of brick, rough-casted, the roof being covered with red tiles. The contractor was Mr. Yorke Bicknell, of Fernhurst.

The new entrance to Bailbrook House, Bath, is a refined piece of work. A drawing of it is hung in this year's Royal Academy Exhibition.

St. Mark's, Venice.—As the outcome of Mr. Reginald Blomfield's letter to the "Times" (see p. 313 of our issue for June 7th) a memorial has been drawn up by the Society for the Protection of Ancient Buildings expressing the opinion that the substitution of modern reproductions for old carving, the removal of mosaics to the tribunes or piers supporting the central cupola, and more particularly the taking up and levelling of the old floor of St. Mark's, would not in any way whatever contribute to the security of the building, whereas such works would destroy what have been for centuries its characteristic features.—The piled foundation for the new Campanile is now finished and work is proceeding with the erection around of a wall 10ft. thick, built of large stones from Istria and Muggia. Very patient research is being made with regard to the rebuilding of Sansovino's loggetta, though the actual work of rebuilding will not be begun for some years to come.



HOUSE AT ASHURST, FERNHURST, SUSSEX.
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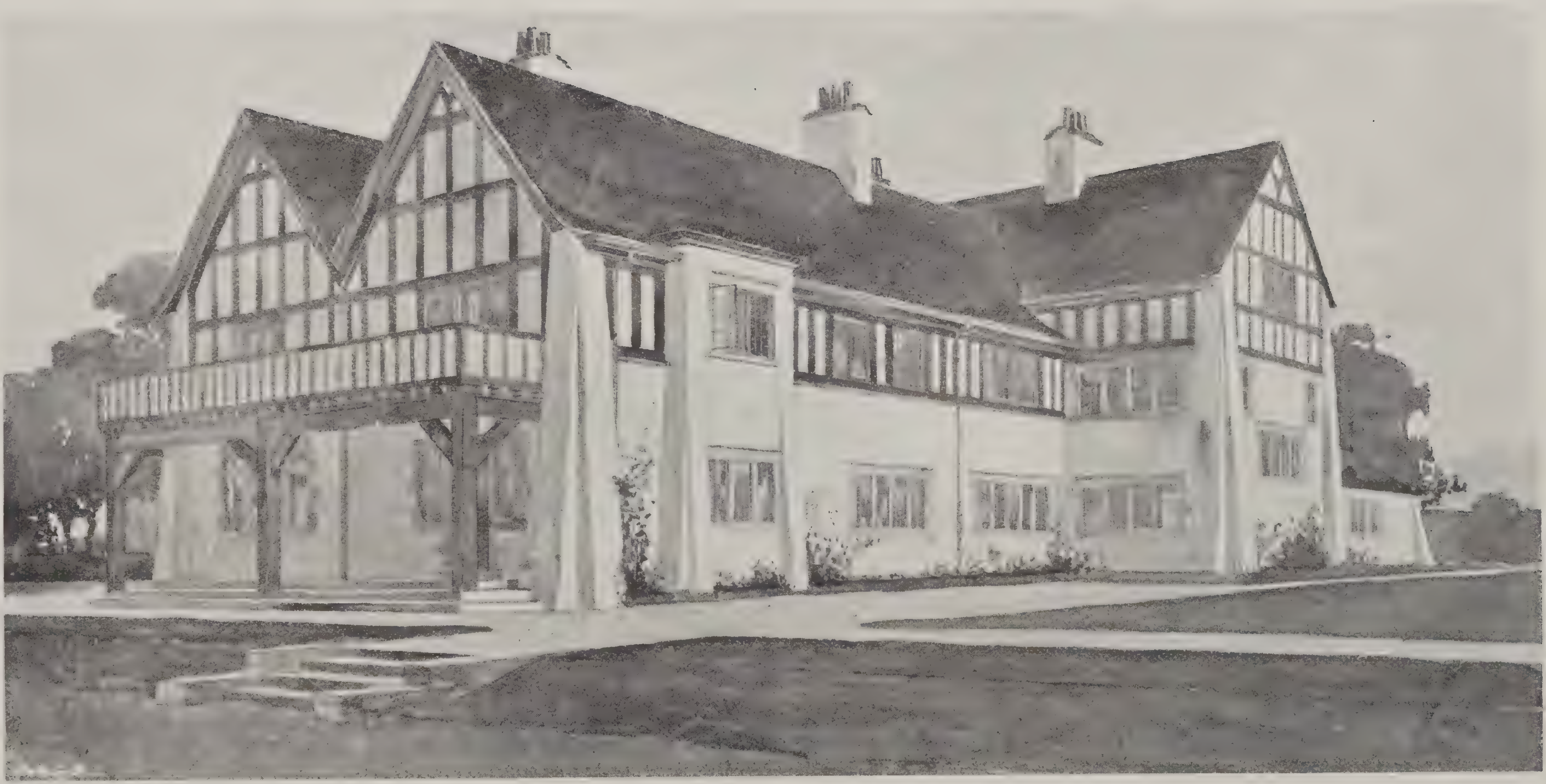

ASHURST HOUSE, FERNHURST, SUSSEX. J. PERCY HALL, A.R.I.B.A., ARCHITECT.

Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
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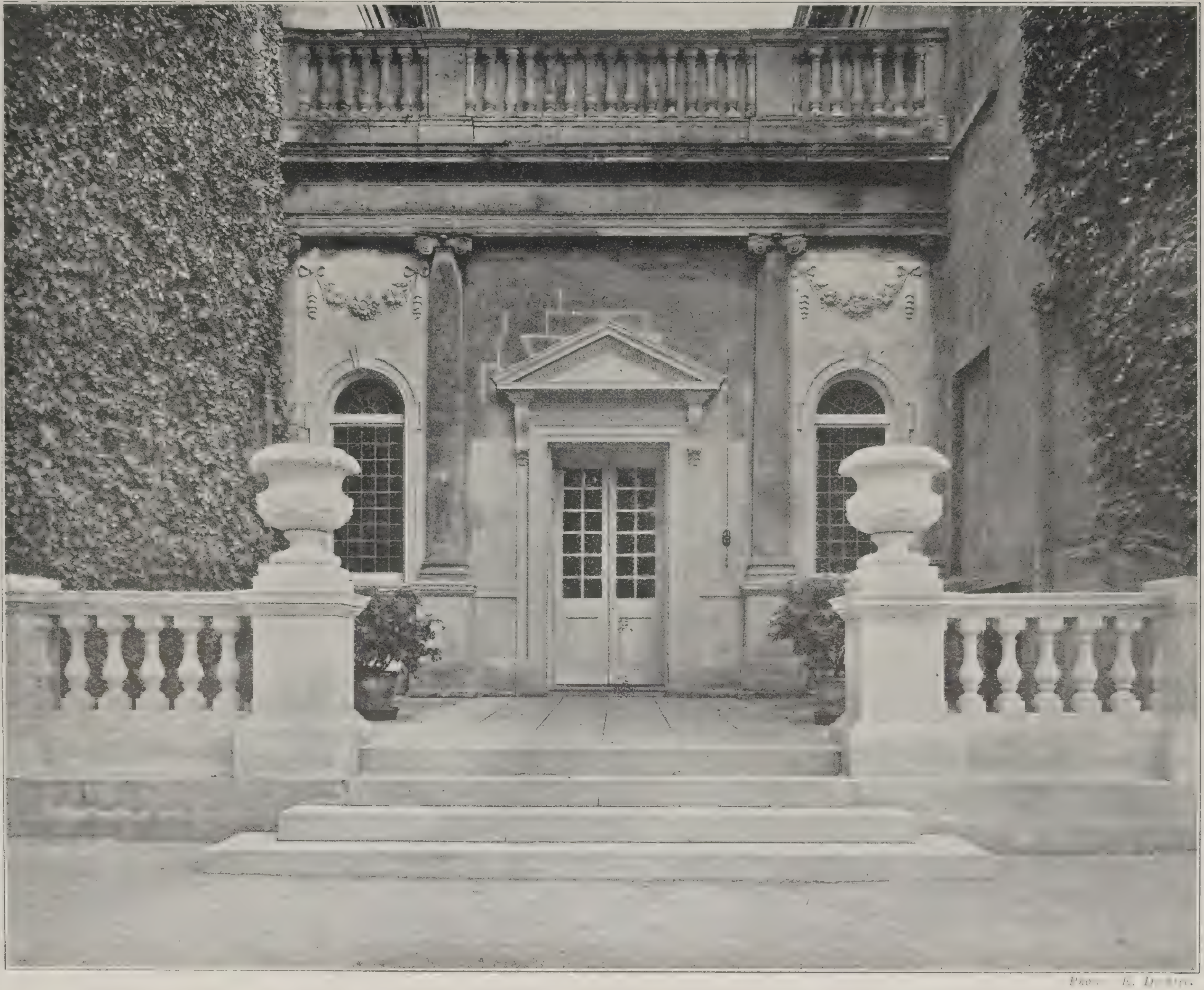

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HEATING AND DUST.[*]

By Prof. W. F. BARRETT, F.R.S., M.I.E.E.

ALL heating appliances depend upon the transference of heat from some source to the parts of the building it is intended to warm. This transfer can be effected in three ways: by the slow process of conduction, by the quicker process of convection, or by the swift process of radiation. In the case of hot-water pipes all three processes are at work, the heat is conducted through the iron pipes, which warm the room both by radiation and convection. In the case of an open fire, radiation is practically the only agent by which the heat is distributed to the persons in and to the walls of the room. As the air is almost as transparent to radiant heat as it is to light, the air of a room cannot be warmed by radiation, and hence our domestic open fire-grates warm the rom indirectly by heating the floor, walls and furniture, and these absorbing the radiant heat warm the adjacent air by convection. This latter process consists in the transfer of heat by moving masses of the warmed air or other fluid, the motive force being gravity, the colder denser air displacing the lighter warm air. These currents are the means by which all fluids are heated, as both gases and liquids are very bad conductors of heat.

Radiators cause Walls to become Dirty.

In all systems of heating by radiators the air is warmed; the walls of the room are therefore cooler than the air, and it is a matter of common observation that when this is the case the walls become rapidly covered with dust and dirt. On the other hand, when the room is warmed by a open fire the air is not heated by the radiation from the fire, but the walls are, and it is the warm walls which warm the room. When this is the case—the air being cooler than the walls—much less dust and smoke are deposited on the walls, which therefore remain cleaner much longer than in a room which is heated by warm air. This is notably seen in the difference between the wallpapers in a room heated by an open fire and a room heated by a stove; in this latter case the wallpapers become rapidly disfigured and dirty by an unsightly deposition of dust. Many are under the impression that this is due to the dust and dirt caused by the stove or the leakage of smoke through the joints in the stove pipes, but that this is not the cause is seen from the fact that gas stoves give rise to precisely similar dirtying of the walls as coke stoves, and so do systems of heating by hot air. In fact, everyone must have noticed the upward stream of dust and dirt that attaches itself to the wall in the immediate neighbourhood of a radiator, whether that radiator be warmed by hot water, steam or gas. So great and so constant is this disfigurement that it has been urged as an objection to the use of radiators and heating by hot-water pipes; and in some cases the radiators are placed in the middle of a room or far from the walls to get rid of this annoyance. The same thing may be noticed where hot-water pipes run along the wall; near the pipes this wall gets blackened.

Clearly it cannot be due to any dust created by the radiators, for they are perfectly clean surfaces. It is, therefore, a matter of some importance to try and ascertain the cause and thus, if possible, remedy this defect in the use of all radiators. For this purpose we must turn to physics, and the investigations of Aitken in Scotland and Lodge in England on the phenomena of the deposition of dust have in recent years given us the solution.

Many years ago Professor Tyndall noticed that when dusty air was strongly illuminated by a sunbeam or by the electric light there rose from the summit of any heated body placed within the dusty air a stream of dust-free air. This was rendered apparent by its not scattering the light; and hence a fine black stream was seen rising up from the hot body. Anyone can see this by heating a wire or rod of metal and putting it in a glass vessel filled with smoke; upon brilliantly illuminating the smoke a sharp black line will be seen above the hot line or rod. Tyndall, Frankland and Lord Rayleigh have given different explanations of this experiment, but none were satisfactory. Professor, now Sir, Oliver Lodge and his demonstrator, Mr. J. W. Clark, took up the matter, and made numerous experiments. Almost simultaneously Mr. Aitken in Scotland began working at the matter and arrived at much the same explanation as Professor Lodge.

The general result of all these experiments showed that the invariable tendency of fine dust particles is to be

Driven away from Warm Surfaces

and to deposit themselves on any neighbouring cold surface. The dust free stream of air rising from a hot body is caused by the warm body being surrounded by a dust-free coating of air, and the ascending current of warm air carries this dust-free layer with it, giving rise to the dark stream line seen above the warm body.

Many striking experiments were made by Mr. Aitken to show the tendency of dust to leave a warm surface and attach itself to a cooler surface. Thus if two mirrors, one hot and the other cold, are fixed face to face near to each other and placed for a few minutes in a vessel filled with a dense cloud of dust, formed by burning a little magnesium wire within the vessel, it will be found when the mirrors are removed that the warm mirror is perfectly clean whilst the cold one is coated over with magnesia dust. Or if two glass rods, one cold and the other hot, are dipped into some hot magnesia powder and then taken out, the warm rod will be found to come out quite clean but the cold rod is thickly coated with powder.

Effects on Partitions and Ceilings.

But the most interesting illustration of the repulsion of dust from a warmer to a cooler surface is seen on partitions of timber-framing plastered and plastered ceilings. Wherever the wood framing or joists occur the wall is clean, whereas the rest of the surface is darkened by adherent dust. In fact, the wall or ceiling appears to become transparent—showing the wooden studs through the plaster. This is due to the fact that the wood, being a bad conductor of heat, remains warmer than the adjacent plaster, and hence the dust leaves the part where the wood is beneath and attaches to the cooler plaster.

Repulsive Force of Heat.

It looks as if the old idea of a repulsive force produced by heat was, after all, correct. In fact, if we heat in a crucible any fine incombustible powder such as magnesia or silica, we shall see the particles of the powder become self-repellant and mobile like a liquid. Heat, we know, does lessen the cohesion of bodies, making a rigid and brittle body like glass become ductile and viscous; it does drive the molecules of bodies further apart, causing a cubic inch of water to become nearly a cubic foot of steam or 273 cub. ft. of air at the freezing-point to become 373 cub. ft. at the boiling-point. But the expansion, and the change of state from solid to liquid and liquid to gas produced by heat, is due to the greater amplitude of vibration, the increased width of the swing, of the molecules of a body, and does not necessarily involve a repulsive force radiated from the hot body, though its kinetic energy is increased by heat.

Here we have a practical means of filtering air from dust: it is only necessary to have two concentric tubes, the inner one conveying steam and the outer one kept cold; any dusty air passed between the hot and cold tube will deposit its dust on the inner surface of the cold tube, and much finer dust or germs can be so deposited than can be stopped by filtering through ordinary screens.

Fog.

Mr. Aitken has shown that every drop of rain has a nucleus of some sort—usually a dust particle. In fact, the case with which vapour condenses to fog is a test of the presence of numerous smoke or dust particles: if there are few dust particles in the atmosphere the vapour forms a mist or fine rain, and the purity of mountain air no doubt explains the mountain mists so frequent in the Highlands. Were there no nuclei at all condensation would not occur. This discovery led Mr. Aitken in 1893 to devise a pocket dust-counter. The air in a small vessel is first rendered dustless and exhausted by a simple device, and then a sample of the air to be tested is admitted. This is chilled by partial exhaustion and the condensed vapour falls down on to a plate in tiny droplets, each drop having a dust nucleus. By counting these drops in any small area, the number of dust particles in a given volume of air is found. Thus in the purest mountain air about 250 dust particles per cubic centimetre were found. In clear country air 500, whilst in London and Paris, the number of solid particles varied from 80,000 to 210,000 per cubic centimetre. I think Mr. Aitken's ingenious little instrument should be in the hands of every engineer so as to test the value of the screens used to filter the air admitted to buildings.

Atmosphere polluted by Dust.

The following are some of the conclusions arrived at by Mr. Aitken:—

(1) The earth's atmosphere is greatly polluted with dust produced by human agency.

(2) This dust is carried to considerable elevations by the hot air rising over cities and from the sun-heated areas of the earth's surface and by winds driving the dusty air up the slopes of hills.

(3) The transparency of the air depends on the number of dust particles in it and on its humidity. The less dust and the drier it is the more transparent it is. . . . Water apart from dust does not seem to affect its transparency.

(4) Haze is generally produced by dust; if the air be dry the vapour has little effect, the density of the haze depending chiefly on the number of dust particles present.

(5) The dust particles in the air have vapour condensed on them, though the air itself may not be saturated.

(6) The amount of vapour condensed on the dust in unsaturated air depends on the humidity of the air. The higher the humidity the greater the moisture held by the dust particles when the air is not saturated.

(7) The amount of dust in the atmosphere of pure country districts varies with the velocity and the direction of the wind. Fall of wind is accompanied by an increase in dust. Winds blowing from populous districts generally bring dusty air.

Clearing Air by Electricity.

There is another way of ridding the air of dust which has been the subject of a good deal of experiment by Sir Oliver Lodge—that is, the discharge of electricity from a point. Even a small electric machine can quickly clear a large bell jar of a cloud of smoke or dust by discharging its electricity from a point in the bell jar. Possibly at some future date the atmosphere of smoky and foggy towns may be rendered clear by continuous and powerful electric discharges. The coating of dust over the leads of electric wires is often noticed, especially in the flexible wires which suspend incandescent electric lamps. This is simply an effect of electric attraction on the dust in the air.

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[*] Summary of a paper read at the summer meeting of the Institution of Heating and Ventilating Engineers on June 20th.

FINANCING BUILDING SCHEMES IN THE STATES.*

By **CHARLES W. RUSSELL.**

THE methods of financing building schemes vary in different places. In New York many schemes have been adopted for a while, to give place at length to other methods. For example, when apartment houses were first introduced they became very popular. Then what was known as the co-operative apartment-house scheme was invented. The promoters would get the refusal of a piece of land, have plans drawn, and organize a company of people who wanted homes. The plan was to give the owner of a certain amount of stock a perpetual lease of an apartment (very similar to the custom in Venice of different floors in a building belonging to different owners). A great many large apartment houses were built on this scheme, but after one notable instance, in which the mortgage was foreclosed and the stockholders wiped out, the method was abandoned.

Leasehold Property not Favoured.

Formerly much of New York City was built on leasehold property, and many of the finest stores are on leased land. But now very little is on leasehold, and it is almost impossible to finance a large proposition in New York if the fee of land is not included. This is not the case in Chicago, where many very large and high buildings are on leased ground.

Speculative Houses.

Most of the dwellings in the large cities of the world have been built by operators building rows of similar houses and selling them separately. This form of operation appeals to a large number. Men of small capital can start in a small way, and by investing their profits in more houses often build whole neighbourhoods. They are usually successful during rising markets. Of course, houses reproduced a number of times can be built more cheaply than separate houses.

The plan of finance is often to employ an "architect" to make the plans of one house. A loan is then procured, and the different sub-contractors are induced to wait for their final payments until some of the houses are sold. But there are many builders who build very good houses to sell in New York, and a large number of fireproof residences have been built and sold, and not a few have fetched between 100,000 and 200,000 dols. each in the last few years. There are very few private residences built at present on Manhattan Island, apartment houses being the vogue.

Loans.

In the financing of a building scheme the promoter has usually to provide the difference between the amount of money that can be borrowed on the enterprise and the cost of it. The permanent loan is usually made by a financial institution on a conservative basis, lending only 50 or 60 per cent. of the value of the enterprise at a low rate of interest. If the conservative institutions decide for certain reasons not to lend money there is very little promoting done until they wish to lend again. Of course, there is a great deal of money lent by private individuals, but their loans are generally of smaller amounts. There are institutions which make a business of lending and selling the mortgages to private individuals. Thus, the financial institutions have the first claim on most enterprises. They decide whether there will be an active business or not. If they are desirous of lending, there are always operators who are anxious to promote enterprises.

Builders who Finance.

As the size of operations in the United States has increased to enormous proportions, so have construction companies been formed with very large capital. Some of these have increased their scope until now they will underwrite the mortgage, assist in financing the whole operation, and erect the building. This class of operation is almost exclusively confined to central and staple property.

To Avoid Loss by Forced Sale of Valuable Land.

A popular mode of procedure for men who wish to operate in real estate is to form a company, usually called a realty company, and for each particular building scheme a subsidiary company is formed by the parent company, which method, under the laws of the State of New York, eliminates the element of personal liability of the stockholders.

There is a large field for these realty companies, managed on conservative lines, and they are of great advantage to people who are forced to improve their property. It may be that their buildings are too poor to compete with new neighbours, or too old, or that they have been destroyed by fire, &c., or for other reasons. For example, a man has a piece of property in a business centre which he is forced to sell or improve, and which is appraised at, say, 1,000,000 dols.; it does not carry itself, and there is not a ready sale for it at that price. A realty company might make the following proposition, viz.:—To erect on it a building costing, say, 1,000,000 dols.; to pay him for his land 600,000 dols. in cash and 400,000 dols. in second mortgage bonds of the company. The realty company would borrow from a financial institution, say, 600,000 dols. on the land, and, say, 500,000 dols. on the building as it progresses. After paying the owner 600,000 dols., they would have 500,000 dols. in cash for the building, and the stockholders would have to put in the balance, 500,000 dols., and own the equity. In some instances the company issues no second mortgage bonds, but only stock.

There are many men who are forced to sell or improve their property, and while they have not the means to improve it themselves, they would prefer to keep an interest in it to selling it altogether, and they also feel that the experts in the realty company know better than they what the nature of the improvement should be. Perhaps the owners are not in this country, or perhaps they are not in a position to wish to take much trouble in posting themselves as to the requirements. Some proposition like the above, in which they retain stock, naturally appeals to them. Of course, if the realty company puts in very little cash, it may prove a poor operation for the owner of the land, as he is taking most of the risk and had better get most of the profits.

Stocks and Shares.

The financing of large building schemes has been tried on very much the same lines as railroads are financed, that is, issuing bonds and stock in shares of, say, 100 dols. each. Also large schemes have been carried out in Boston, I am told, by selling only stock in small shares without the property being bonded, and again other large schemes have been successfully carried out by selling first mortgage bonds in small amounts; the stock in such an instance representing no payment in cash, but professing to represent the earning power over expenses. These methods have not been popular in New York.

Real estate has increased so much in value in large cities that it would not be possible for most men to invest in it if it were not through these companies. While formerly only the rich were able to participate in large enterprises, now, through the large corporations, the people can be interested in all the great enterprises of the country.

Building Societies.

Building loan schemes in great numbers have been started for persons who wish to build homes. Under their plan the tenant gets the property upon the payment of a very small equity. He then, in lieu of rent, may pay off each month a small portion of the mortgage, in addition to the carrying charges.

Cost and Time to Finish.

The questions How much will a building cost? and When will it be finished? are of the greatest importance to the financier. These questions depend largely upon the labour conditions, on which subject the architect and his client—the owner—are not usually given a chance to be heard, although the owner is the greatest sufferer from strikes and lock-outs: his interest account is going on all the while, and he has very much more at stake than the builder.

A company that could give a guarantee to finish a building at a certain time for a certain amount of money would indeed facilitate any building scheme. Let us hope that this may soon be the case.

The Architect's Part.

It is not the province of the architect to formulate the financial scheme or to place the securities of the project He may be called upon to design a new building, introducing features which will make it superior to its competitors. He is usually expected to prepare preliminary plans, specifications, and to give an estimate of the cost of building, carrying charges and operating expenses in the shortest possible time. He should theoretically not put in anything that is not of use. He should at the same time make his building pleasing to the public, without adding necessarily to the cost.

Conditions of the Problem.

Assume, for instance, that it is proposed to finance the construction of a high office building in some great centre. To ensure a good income the requirements above the first and second storey would probably be to have as many windows as possible, not too large to be easily operated and yet as large as practicable.

Each window would be separated from each other window, preferably by masonry, as it is advisable to have as little steel as possible exposed to the elements, but steel thoroughly covered with cement masonry is supposed not to deteriorate.

Projections over adjoining property should be dispensed with to avoid legal complications. Many title-guarantee companies discriminate against such encroachment.

A large cornice is a disadvantage to windows under it.

Therefore, the requirements which confront the architect are a flat wall pierced with windows at equal intervals,

Like a Waffle Iron,

and not even relieved by a large projection. Although this is a very difficult proposition, it is certainly a very interesting one.

The high building is essentially American. It is a new proposition and requires more originality to solve than a problem where some historic example from the Old World may be taken as a prototype. And the skyscraper has come to stay—of that there is no doubt whatever.

Would it not seem as if these requirements might best be met by the application of colours? If someone would use bright-coloured terra-cotta, for example, omitting large projections, but with a handsome skyline, and so make a beautiful building, he would indeed deserve the thanks of the community.

The Egyptian, Greek, Roman, Romanesque and Gothic architects all felt the want of colour, and used it, and although colour had perhaps better not be suggested by an architect until he is quite sure that he will be employed, it seems to be a subject for serious consideration.

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* Paper read at the 38th Annual Convention of the American Institute of Architects.

THE STRENGTH OF COLUMNS.*

By Prof. W. E. LILLY, M.I.M.E.

THE design of a column of a given length to carry a given load involves the determination of the area and radius of gyration of its cross-section, and thus indirectly of its thickness. The formulæ in general use do not take into consideration the ratio to be adopted between these quantities, it being left to the designer to assume empirically some values which seem most suitable under the circumstances. Considered from a theoretical point of view, there is for every column of given length and load a definite area and radius of gyration for the most economical cross-section, and any departure from these involves waste of material. For instance, take the case of a hollow mild-steel column of circular cross-section, if the diameter is large and the thickness small the column fails by wrinkling of the sides of the column or by secondary flexure; if the diameter is small and the thickness great, it fails by primary flexure or bending; hence there is some diameter and thickness which will give the most economical result. The experiments contained in this paper were carried out with a view of determining experimentally the conditions under which failure takes place either by primary or secondary flexure, and to obtain indirectly some definite information as to the values of the areas and radii of gyration of the economic cross-sections.

For this purpose it was decided to test a number of mild-steel tubes similar to those now so generally used in cycle construction, and of as nearly as possible a uniform quality throughout. A consignment of these was obtained, of which the following table gives particulars of the diameters and gauges of the tubes that were tested:—

External Diameter.	Thickness, Standard Wire Gauge.					
inch.						
$\frac{3}{8}$	16	17	18	19	20	22
$\frac{7}{16}$	16	17	18	19	21	22
$\frac{1}{2}$	17	18	19	20		
$\frac{5}{8}$	18	19	20			
$\frac{3}{4}$	18	19				
$\frac{7}{8}$	18	19				
1	18	19				

The experiments were carried out in the engineering laboratory of Trinity College, Dublin, on a 10-ton Wicksteed testing machine of the vertical type. Unfortunately, owing to the small size of the machine, it was impossible to make the experiments as complete as the author could have wished; it was decided for this reason to limit the investigation for the present to round-ended columns with a view of in the near future continuing the experiments on columns with fixed ends, when a machine of larger size will be available.

The tubes were prepared for testing in the following manner. The dimensions of the tube having been ascertained, measured lengths were cut off; these were then trued up in the lathe to ensure straightness, the ends at the same time being faced off square. Hard steel round-ended pins with square shoulders were fitted to the ends of the tubes as shown on Fig. 1 (see next page); they were then ready for testing.

The mode of testing was to place the tube vertically in the testing machine, the round ends bearing on steel discs as shown on Fig. 1, the surfaces being very slightly concave to enable the specimen to be easily adjusted. The test was then carried out in the usual manner and the load producing failure noted.

The number of experiments carried out

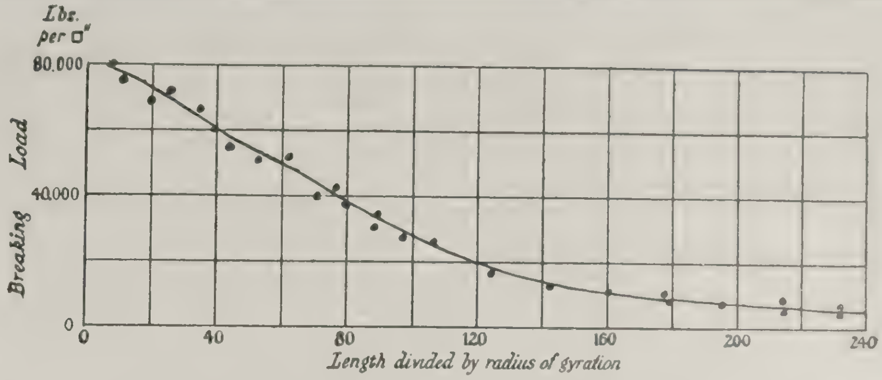

FIG. 2.—Diameter, $d = \frac{3}{8}$in. Standard Wire Gauge, $g = 16$. Area of cross section, $A = 0·063$ sq. in. Radius of gyration, $\rho = 0·11$. Thickness of tube, $t = 0·17d$. $(\rho/t)^2 = 3$.

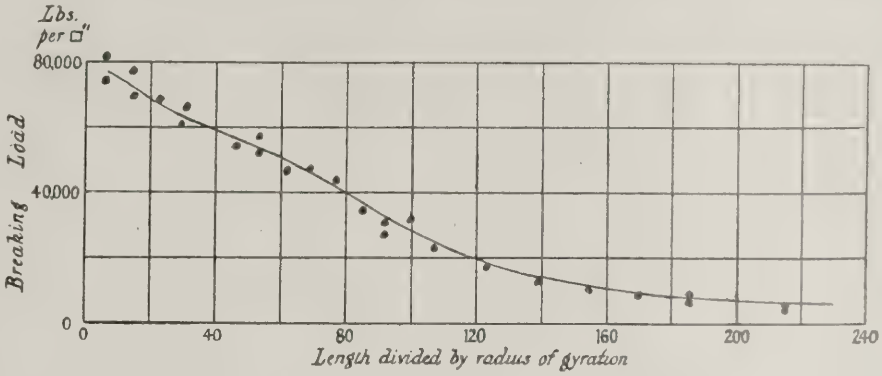

FIG 3. $d = \frac{7}{16}$ in. $g = 16$. $A = 0·076$ sq. in. $\rho = 0·13$. $t = 0·14d$. $(\rho/t)^2 = 4·8$.

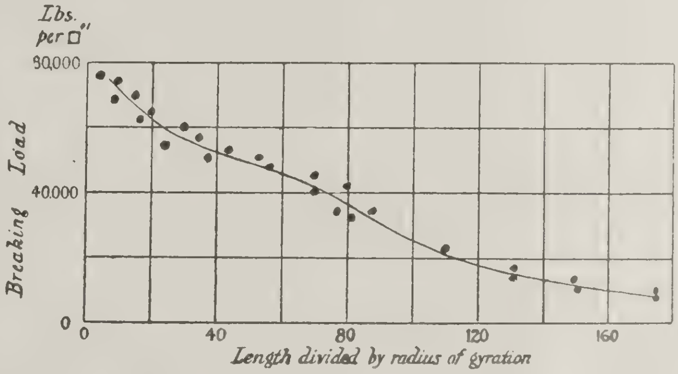

FIG. 4. $d = \frac{1}{2}$in. $g = 7$. $A = 0·077$ sq. in. $\rho = 0·16$. $t = 0·11d$. $(\rho/t)^2 = 8·3$

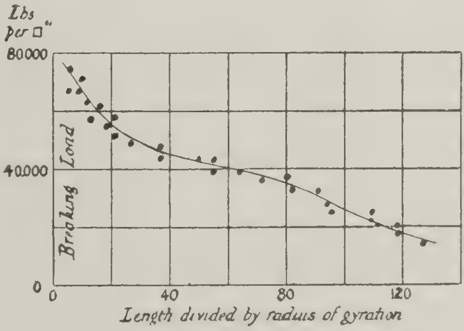

FIG. 5. $d = \frac{5}{8}$in. $g = 18$. $A = 0·086$ sq. in. $\rho = 0·21$. $t = 0·077d$. $(\rho/t)^2 = 19$.

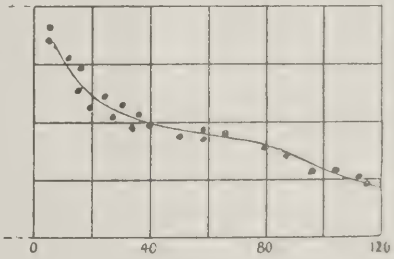

FIG. 6. $d = \frac{3}{4}$in. $g = 18$. $A =$ [illegible] sq. in. $\rho = 0·25$. $t = 0·065d$. $(\rho/t)^2 = 27$.

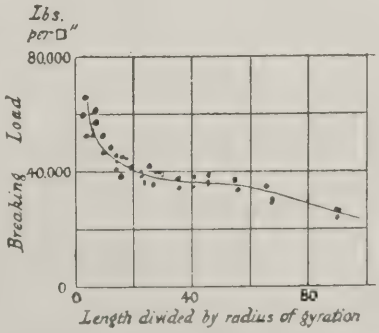

FIG. 7. $d = \frac{7}{8}$in. $g = 19$. $A = 0·11$ sq. in. $\rho = 0·31$. $t = 0·046d$. $(\rho/t)^2 = 60$.

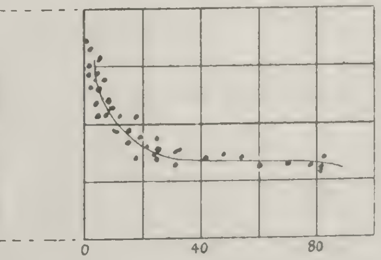

FIG. 8. $d = 1$in. $g = 19$. $A = 0·12$ sq. in. $\rho = 0·34$. $t = 0·04d$. $(\rho/t)^2 = 72$.

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* A paper read last week before the Liège meeting of the Institution of Mechanical Engineers.

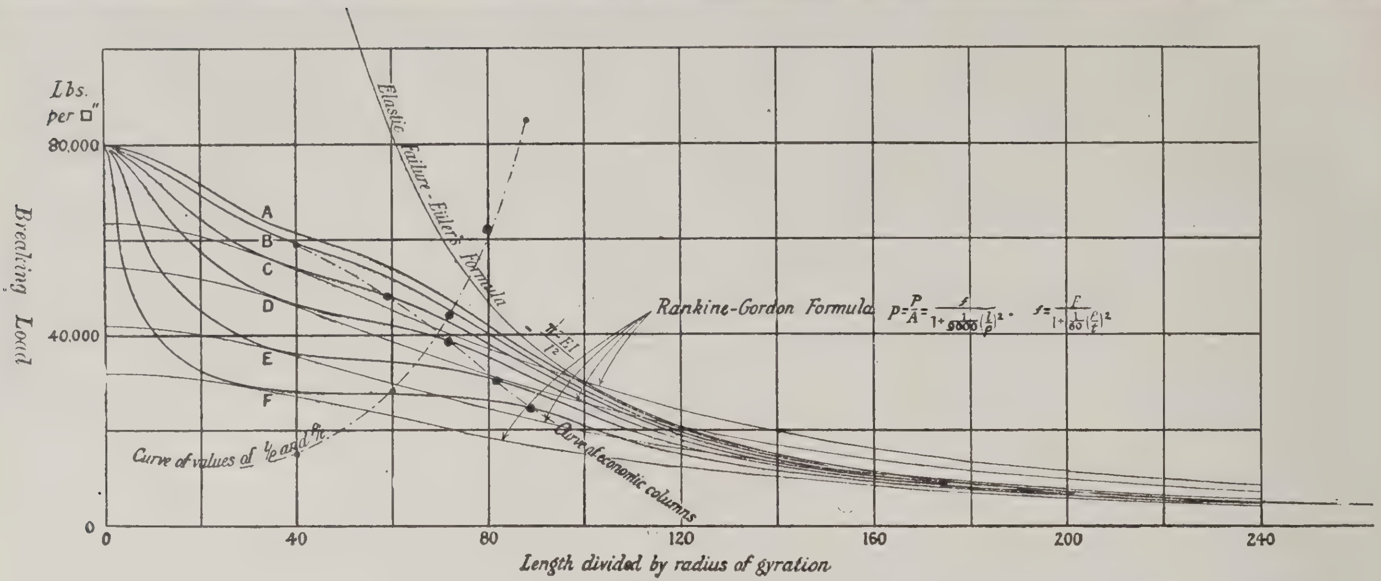

FIG. 9.—DIAGRAM DEDUCED FROM EXPERIMENTS ON MILD STEEL TUBES SHOWING THE INFLUENCE OF THICKNESS IN DETERMINING THEIR FAILURE.

on various lengths of tubing exceeded eight hundred; of these only a selection is given, on Figs. 2-8 (preceding page), which bear more directly on the investigation.

The author considers that no useful purpose would be served by giving more of the results of these experiments in detail. As was to be expected, owing to the variations that occurred in the quality of the material, some difference was shown in a few cases from the results as given, more especially on the short lengths tested. The results of these were averaged, giving a close approximation to the curves of the tubes shown on Figs. 2–10. The data given on the diagrams, Figs. 2–8, refer to the individual tubes tested. On the base line, values of l, the length, divided by ρ, the radius of gyration, are plotted, the breaking load for these values being plotted vertically. The numerical values of the diameter = d, standard wire gauge = g, area of cross-section = A, radius of gyration = ρ, and the thickness = t of the tube are given on each diagram respectively. The curves on Fig. 9 show the influence of the thickness in determining the load which produces failure; they have been deduced from the curves shown on Figs. 2-8, the diameter and thickness of the tube being varied and the area of the cross-section kept constant, the uppermost curve of the series being for the limiting case when the tube becomes a solid bar. If now the curves on Fig. 9 be plotted with the base line representing length and the breaking load for these values vertically, a series of curves is obtained as shown on Fig. 10; from the inspection of these the influence of the diameter and thickness upon the length is very clearly shown, and from this it will be seen that the economic ratio of the diameter and thickness for a given cross-section depends upon the length of the column.

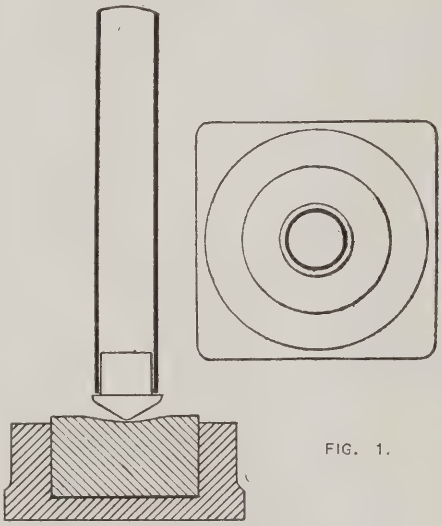

FIG. 1.

TUBE READY FOR TESTING, FITTED WITH HARD STEEL PIN AND BEARING ON STEEL DISC.

The breaking strength to tension of several specimens cut from the tubes under test was determined, giving results which varied from 62,000 to 85,000 lbs. per sq. in.; the average of these tests was nearly 72,000 lbs. per sq. in.

The determination of the strength to compression of the mild-steel tubing, that is, the strength of very short specimens, was a matter of some difficulty, owing to the bulging and upsetting of the specimens when thick and to the wrinkling or doubling up of the specimens when thin; the average of the breaking strengths to compression was 80,000 lbs. per sq. in. This value has been adopted throughout in plotting the curves on Figs. 9 and 10.

Experiments were also made for the determination of Young's modulus of elasticity, giving an average value of 30,000,000 lbs. per sq. in.; this value has been adopted throughout in plotting the curves on Figs. 9 and 10.

The following phenomena were observed during the carrying out of the tests. That for all columns there is a certain value of l/ρ beyond which the failure is sensibly due to elastic bending, the load producing failure varying inversely as the square of the length; that as the value of ρ/t increased, the value of l/ρ increased for the load producing failure by elastic bending: the curves on Fig. 9 show this. When the failure of the column takes place by secondary flexure for a large range of the length, there is little variation in the breaking load. Hodgkinson in his experiments on wrought-iron columns has previously remarked on this.

As the load approached the breaking load there was on the short lengths a decided yielding of the tube before failure.

Before proceeding to the discussion of the results of the experiments as given on the diagrams, some of the formulæ in general

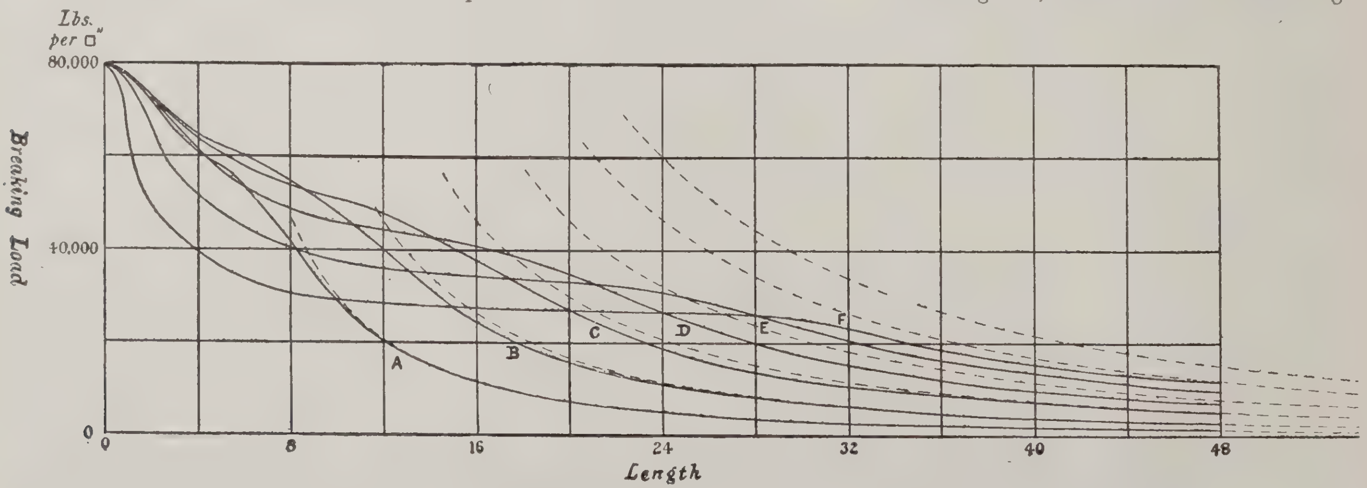

FIG. 10.—DIAGRAM DEDUCED FROM THE EXPERIMENTS ON MILD STEEL TUBES SHOWING THE EFFECT OF VARYING LENGTH, DIAMETER AND THICKNESS ON THEIR FAILURE, THE AREA OF THE CROSS-SECTION BEING CONSTANT.

use for the design of columns will be examined; of these Eüler's and the Rankine-Gordon formulæ are the most important.

Eüler's formula[*]:—

$$P = \frac{\pi^2 EI}{l^2},$$

where P = the load on the column, E = Young's modulus of elasticity, I = moment of inertia of the cross-section, l = length of column.

This formula, derived by Eüler from the theory of elasticity, is only applicable to columns which fail by elastic bending, that is, to long columns. For practical columns with the usual ratio of l/ρ it fails to give the breaking load. As will be seen from the tests of the tubes on Figs. 2-8, it applies with a fair degree of accuracy to long columns, the influence of the ratio ρ/t causing but little variation in the strength. The experiments of Christie[†] on long columns lead to a similar conclusion.

Rankine-Gordon formula[‡]:—

$$P = \frac{fA}{1 + c\left(\frac{l}{\rho}\right)^2},$$

where f = about two-thirds the compressive strength of the material, for wrought-iron = 36,000 lbs.; A = area of the cross-section; $c = \frac{1}{9000}$ for columns with round ends, $= \frac{1}{36000}$ for columns with fixed ends; l = length of column; ρ = radius of gyration of the cross-section.

This formula gives approximately the breaking load for both short and long columns, the value of f and c being determined from experiments. For short columns the strength depends mostly on f, the strength of the material, the value of $c\,(l/\rho)^2$ being small, and for long columns the strength depends on elastic bending, that is, the term $c\,(l/\rho)^2$ involving the modulus of elasticity.

The formula takes no account of the ratio ρ/t, nor does it in any way point out the most economical values of l/ρ to be used, the ratios adopted in practice being the result of experience.

On the diagram (Fig. 9) the breaking load for the tubes calculated from Eüler's formula is shown: for values of $l/\rho > 120$ for the solid bar to values of $l/\rho > 240$ for the thinnest tubing the failure is sensibly elastic and the experiments are practically in accordance with the values as calculated. In all cases of long columns some elastic deflection was apparent before failure; the columns were then in a state of equilibrium, and it was not till the deflections exceeded a certain amount that collapse took place.

It has already been remarked that the curves shown on Fig. 9 were for purposes of comparison drawn so as to refer to tubes of constant cross-section. The manner of deducing these curves from the curves on Figs. 2-8 was as follows:—The Rankine-Gordon formula was used in the form

$$p = \frac{P}{A} = \frac{f}{1 + \frac{1}{9000}\left(\frac{l}{\rho}\right)^2}.$$

By giving suitable values to f curves similar to those shown on Fig. 9 were obtained. From a critical examination of these curves it was evident that the value of f depended on the failure of the tube by secondary flexure. Now the experiments show that this secondary flexure does not depend on the length of the column but only on the thickness and the radius of gyration.

To determine by analysis from the mathematical theory of elasticity the variation of the strength in terms of these quantities is a complex problem which has not hitherto been solved. It was therefore attacked by an induction process from the experiments. From the inspection of the values obtained it was evident that the load producing failure was less when the diameter was varied and the thickness constant, and greater when the thickness was varied and the mean diameter constant, showing that the strength depended in some way on the ratio ρ/t; by plotting values of ρ/t and the breaking load the following formula was obtained:—

$$f = \frac{F}{1 + k\left(\frac{\rho}{t}\right)^2}$$

where F = the strength of the material to compression, k = a constant for mild steel $= \frac{1}{60}$.

When ρ/t approaches the limiting value of 0·5 for the solid bar the value of f is sensibly equal to F. This formula closely gives the required values and appears to be of the correct form, for it shows that the probable value of f, if deduced from the mathematical theory of elasticity, would be of the form

$$f = B\left(\frac{t}{\rho}\right)^2,$$

B being some constant depending on Young's modulus of elasticity.

Substituting for f in the Rankine-Gordon formula, it now takes the form

$$p = \frac{P}{A} = \frac{F}{\left\{1 + k\left(\frac{\rho}{t}\right)^2\right\}\left\{1 + c\left(\frac{l}{\rho}\right)^2\right\}}.$$

Putting $k = \frac{1}{60}$ and $c = \frac{1}{9000}$ for columns with round ends,

$$p = \frac{P}{A} = \frac{F}{\left\{1 + \frac{1}{60}\left(\frac{\rho}{t}\right)^2\right\}\left\{1 + \frac{1}{9000}\left(\frac{l}{\rho}\right)^2\right\}}.$$

This formula was used to determine the curves shown on Fig 9, the value of F used being 72,000 lbs. per sq. in., which may be considered as being sensibly the strength to compression of the material.

These curves having been determined, the remaining curves, showing the actual failure of the columns, were plotted from the curves on Figs. 2-8. They relate to tubes of the following sizes and of constant cross-section of 0·12 sq. in.

Particulars of tubes shown by Figs. 9 and 10.

External Diameter.	Internal Diameter.	t	ρ	Reference to Curves.
inch.	inch.			
1	0·92	0·04	0·34	F
0·875	0·78	0·048	0·3	E
0·75	0·636	0·57	0·25	D
0·625	0·481	0·072	0·2	C
0·5	0·3	0·1	0·15	B
0·4	0	0·2	0·1	A

The curves shown on Fig. 10 were derived from the curves on Fig. 9, as already described. The diagram (Fig. 9) thus obtained may be used for mild-steel columns with round ends having the same ratio of l/ρ and ρ/t.

The formula takes into consideration both the primary and secondary flexure of the column. Since the column can fail in either of these two ways, it will be of maximum strength when the strength to primary flexure is equal to that for secondary flexure. Now the diagrams show the variation of ρ/t with the length for a constant cross-section, and the question at once arises if the ratio between these quantities can be put in a simple form so as to be of practical use.

On Fig. 9 the economic values of l/ρ and ρ/t were plotted from the curves on Fig. 10 giving the dotted curve as shown; this curve may be considered approximately to be a parabola, having the equation

$$\left(\frac{l}{\rho}\right)^2 = 1000\left(\frac{\rho}{t} - 0·5\right).$$

For the usual values of l/ρ in practice the term 0·5 can be omitted, giving the simplified form

$$\rho^3 = \frac{1}{1000}l^2 t. \quad . \quad . \quad (1)$$

This equation applies to the column of hollow circular cross-section; for columns of other cross-sections the contant $\frac{1}{1000}$ requires to be slightly modified.

Let A be the area of the cross-section, d the mean diameter of the column; then $\pi dt = A$ approximately. Also $\rho = \frac{d}{\sqrt{8}}$; hence $t = \frac{A}{8·9\rho}$ approximately. Substituting in the previous equation—

$$\rho^2 = \frac{\sqrt{A}}{94}l$$

for hollow circular columns and for other cross-sections

$$\rho^2 = \frac{\sqrt{A}l}{h}, \quad . \quad . \quad (2)$$

h being a constant depending on the value of ρ/t of the cross-section required.

This equation shows that ρ varies as $\sqrt{l}$ if the area of the cross-section is constant. Now A represents the area of the cross-section, and is supposed to be known; to determine it, values of p and l/ρ for the economic section were plotted, giving the curve as shown on Fig. 9, the equation of which is approximately—

$$p = \frac{P}{A} = \frac{F}{1 + \frac{1}{3500}\left(\frac{l}{\rho}\right)^2}. \quad . \quad (3)$$

By substitution for A from equation (2) a cubic is obtained giving the value of ρ in terms of P and l and the constants; this equation does not admit of easy solution, and it is better to proceed by a tentative method. Assume a probable value of l/ρ for the column, usually about sixty to ninety for the ordinary run of columns, and solving equation (3), the value obtained is

$$A = 2 \text{ to } 3\frac{P}{F},$$

where P is the load on the column and F the breaking strength to compression of the material; this must be divided by the factor of safety for the practical column, giving

$$A = 2 \text{ to } 3\left(\frac{PS}{F}\right),$$

where S = the factor of safety.

Substituting for A in equation (2) the economic values of ρ can be immediately determined.

The dimensions of the column having been thus ascertained, the value of the safe loads P can be checked by the general formula, owing to the curves of the formula not coinciding with the curves of the actual failure of the columns; the value obtained will in general be less than P, an error on the side of safety.

The experimental work on columns hitherto carried out has been incomplete, owing to the limited range of the experiments; this has led to considerable diversity of opinion, more especially by American observers, as to the value of the constants that should be used in the Rankine-Gordon formula. This is to be expected in view of the results of this investigation, many of the experiments being made on columns of different proportions, the results varied giving different values for the constants in each case.

The general formula applies to columns of mild steel and wrought-iron. The constants for wrought-iron given by Rankine are f = 36,000 lbs. and $c = \frac{1}{9000}$ for columns with round ends. Assuming the strength of the wrought-iron to compression to be 24 to 25 tons per sq. in., this formula gives a value of d/t of about 16 and for ρ/t of 5·5 to 6. Now these constants were derived from Hodgkinson's experiments on columns, of which the average ratio of d/t was approximately 16; hence the formula may be looked upon as being confirmed by these experiments. For the ordinary ratios of ρ/t in practice the Rankine-Gordon formula gives fair results; it does not, however, apply with the same accuracy to solid bars or columns in which the ratio of ρ/t is large; this will be evident from the inspection of the curves in Fig. 9, one of these for which $f = 42{,}000$ lbs. gives good average values, the remaining curves giving values which are either too high or too low respectively for values of l/ρ, at which failure takes place by elastic bending. This discrepancy arises from the fact that in the formula p varies directly with f, that is, the load which a column will carry is supposed to be proportional to the strength of the material; this is not true for long columns, it is the modulus of elasticity which governs its strength, and it is the constant c which involves this quantity. Now there is not much difference between the modulus of elasticity of wrought-iron and mild steel, hence the load which produces elastic failure will not differ much for either material. The experiments of Christie and others confirm this. It has already been remarked that Eüler's formula is sensibly true for long struts; granting this, it would be more logical to assume that

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[*] A proof of this formula is given in Rankine's "Applied Mechanics."

[†] Proceedings, American Society of Civil Engineers, 1884.

[‡] A proof of this formula is given in Rankine's "Civil Engineering."

$$\frac{\pi^2 EI}{l^2} = \frac{fA}{1 + c\left(\frac{l}{\rho}\right)^2}$$

for some particular value of l/ρ, in which the failure takes place by elastic bending; this gives

$$c = \left\{\frac{f}{\pi^2 E} - \left(\frac{\rho}{l}\right)^2\right\}$$
$$= \left(\frac{f}{\pi^2 E} - m\right),$$

where m is some particular value of l/ρ. If this is done, fairly accurate values for the curves shown in Fig. 9 can be determined from the equation

$$p = \frac{fA}{1 + \left(\frac{f}{\pi^2 E} - m\right)\left(\frac{l-a}{\rho}\right)^2},$$

when m and a are constants and the value of

$$f = \frac{F}{1 + k\left(\frac{\rho}{l}\right)^2}.$$

For the present the author is of the opinion that it is better to use the more well-known form of the Rankine-Gordon formula already given until more experimental data has been obtained for the determination of the constants in the above formulæ.

In the literature of the subject referred to at the end of this paper various formulæ are given for determining the strength of columns, none of which take into consideration the economic values of the radius of gyration and thickness for a given length; tested by the direct appeal to experiment, this investigation shows that the values obtained from their use can only apply to comparatively few cases.

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Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Stamping Agreements.

Z. writes: "How long does an agreement stand good without being stamped at the time of signing? Can it be sent to Somerset House and stamped at any time after signature? I signed a contract which the architect said he would get stamped at Somerset House; but I do not believe he has done so. Will that contract stand good if he has not had it stamped?"

An agreement which requires to be stamped must be stamped within fourteen or thirty days of the date of execution, *i.e.*, signing, &c. But if not stamped within this time the Somerset House officials would probably remit most of the penalty if properly approached with a reasonable explanation of the delay or omission. An agreement cannot be used in evidence at a trial unless it is stamped. It can be stamped at the trial on payment of about £11. The architect would be liable for damages if his negligence was the cause of the agreement not being stamped, and provided that he is *employed* under the contract. S. P. J. M.

Sawing Contract.

LINTON.—X. writes: "What would be the best working arrangements and payments for a sawing contract? I have large steam plant adapted for cutting up trees of any size, and it is my intention to find all necessary plant and fuel, the sawyer to find all labour at his own risk. It would not be constant employment, but about two or three times a year—say a month at a time."

Your best plan is to charge a rental of so much per week for the use of your plant. If you will say what is the size of your engine and machine, and what the plant consists of, and whether you supply a driver, I should be pleased to name a rate for your guidance.

M. POWIS BALE.

Clerks of Works under Government.

NEWCASTLE.—TYNE writes: "Where can I get particulars of the examination for clerks of works under Government? What are the subjects, and which are the best books to study?"

Appointments under Government as clerks of works are mostly obtained in open competition, for which certain fees are required. In some appointments it is necessary that the applicant should have had previous experience as a clerk of works. "The Civil Service Year-book," to be obtained through any bookseller, gives all necessary information as to qualifications, fees, &c. Competitions are advertised in the papers, and competitors can obtain information relative thereto on application to the Civil Service Commissioners. As to books, you should consult our "Book List," which gives the names of useful books on the various subjects.

Sketching at Wollaton Hall, Woodsome Hall and Bolsover Castle.

OLDHAM.—LANCASHIRE writes: "To whom should I apply for permission to measure at Wollaton Hall, Nottingham; Woodsome Hall, Huddersfield, and Bolsover Castle, Derbyshire? Have any drawings of these buildings been published?"

Wollaton Hall belongs to Baron Middleton and Woodsome Hall to the Earl of Dartmouth, to whom (or their agents) you should apply for permission to sketch. Bolsover Castle belongs to his Grace the Duke of Portland, and you should apply to his agent, Mr. F. J. Turner, Mansfield Woodhouse, Mansfield. Drawings of Bolsover Castle were published in the Architectural Association Sketch-Book in 1902, Vol. VI., and of Woodsome Hall in 1882, Vol. II. L. G. R.

Buildings to Measure in Northamptonshire and at Aberystwyth.

COVENTRY.—P. A. P. writes: "I propose spending two weeks on a sketching tour in Northamptonshire. Which are the best places to visit? I wish to make a measured drawing of a subject such as a porch."

You will find plenty of material for sketching in the Nene Valley between Northampton and Kettering, both of Gothic and Early Renaissance work. Gotch's book on the Renaissance should be referred to, and a selection made for your measured drawing after visiting some of the places. There are many interesting Decorated churches in this neighbourhood, and the following are worthy of attention:— Earls Barton, Seagrove, Doddington, Moulton, Dallington, Strixton, Wilby. L. G. R.

ABERYSTWYTH.—H. S. writes: "Is there anything in this town suitable to measure for the R.I.B.A. intermediate examination?"

There is not likely to be anything of any great architectural interest in this neighbourhood. Write to the secretary of the Cardiff, South Wales and Monmouthshire Society, Mr. Edgar G. C. Down, 31, High Street, Cardiff, for information. L. G. R.

A Building Transaction.

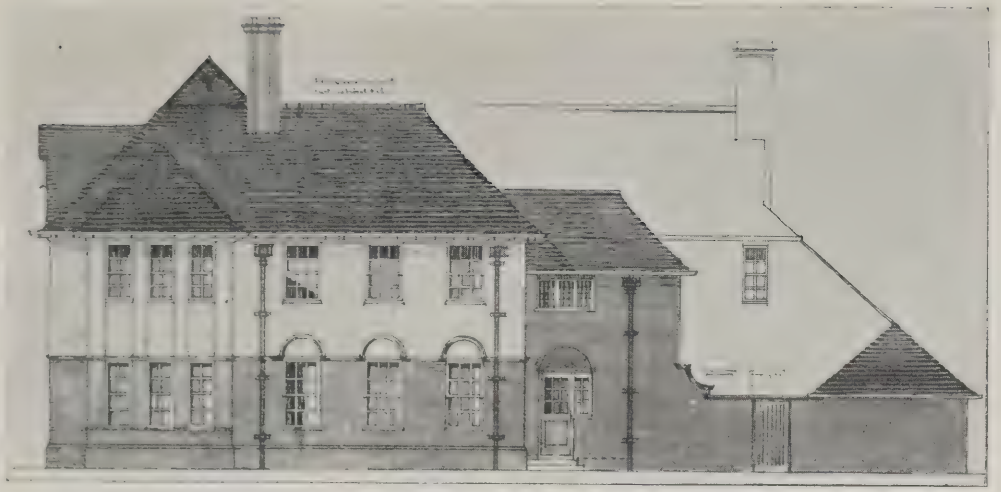
CARNARVON.—LL. writes: "A has leased to B 1,500 sq. yds., upon which B has built eight houses and sold five of them. It is now found that B took possession of 1,690 sq. yds.: that is 190 sq. yds. more than was leased to him. What is A's remedy?"

A has a great number of remedies against B and the five purchasers: (*a*) he can treat B and his purchasers as trespassers on the 190 yds. not sold to them; (*b*) he can retake possession of all or any building on the said 190 yds. The said purchasers have no more right there than B. But they can make it uncomfortable for B for breach of warranty of title, &c. However, if B only made an innocent mistake, A should place the matter before him reasonably and make him pay a fair price or rent for the extra 190 yds. A can confidently place the matter in the hands of a solicitor if B does not pay such price on demand. S. P. J. M.

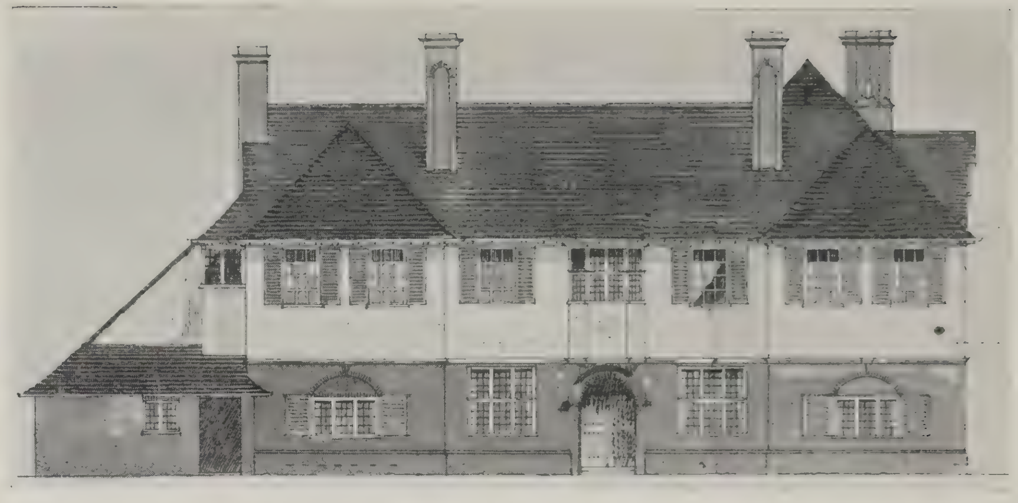
Indentures.

LANCS.—ENQUIRER writes: "I began serving my articles with an architect when fourteen years of age, completing them five years latter. There is a clause in the indenture which states that during my life I shall neither practice in nor within five-miles radius of that town. The indenture was also signed by my father. Is this indenture binding?"

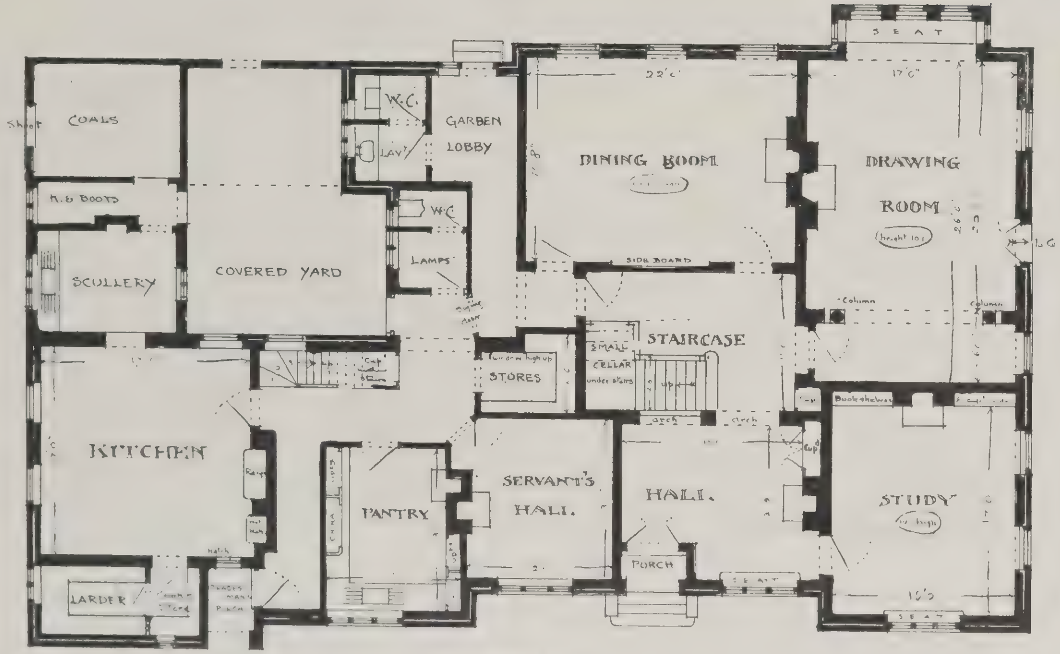
We do not think the indenture is binding. Such an agreement is only binding if made by a person himself after coming of age and for some consideration.



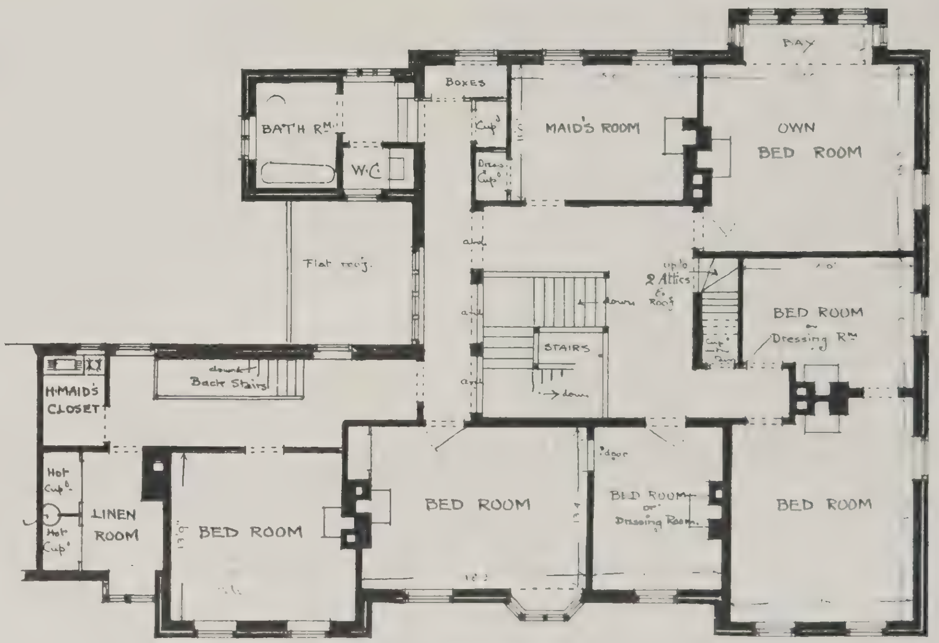
East Elevation.



West Elevation.



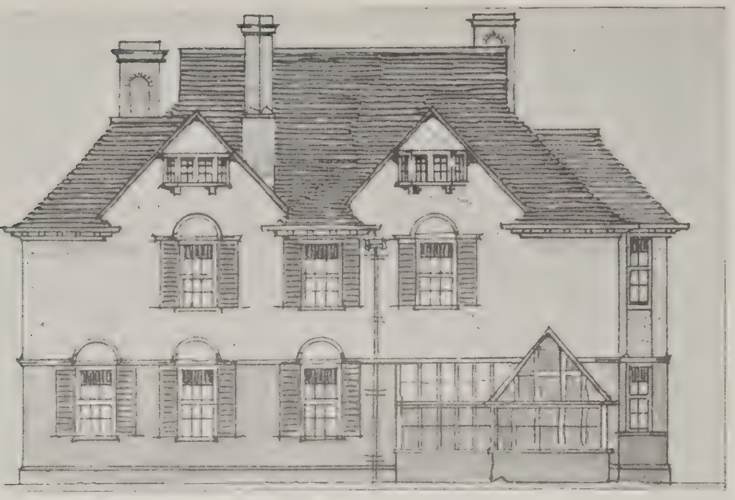
Ground floor Plan.



First floor Plan.

PROPOSED HOUSE ON SHAWFORD DOWNS, NEAR WINCHESTER. ARTHUR C. MARTIN, ARCHITECT.

The materials proposed for this house are brick walls, rough cast on first floor, with a heavy moulding separating the two, and roof of hand-made tiles from Bishop's Waltham. There is a beautiful view to the east which largely influenced the planning The house has been designed to cost about £2,800, for which sum it si hoped to include a certain amount of panelling and a good staircase.



PROPOSED HOUSE ON SHAWFORD DOWNS, NEAR WINCHESTER: SOUTH ELEVATION.
ARTHUR C. MARTIN, ARCHITECT.

Keystones.

A new Thoroughfare connecting Nunhead and Peckham with Brockley is to be made at a cost of £26,500.

Additions to Brixton Hill Prison.—The Prison Commissioners have decided to add about 160 extra cells to the remand prison on Brixton Hill, at a cost of £16,000.

At Windsor Castle, on the East Terrace, an ornamental flight of stone steps has been constructed from the battlemented and gravelled promenade to the beautiful lawn and Palace "slopes."

Shoreditch Town Hall, which was damaged by fire in August last, when the interior of the council-chamber and the whole of the roof were destroyed, is about to undergo restoration at a cost of £20,000. Mr. A. W. S. Cross is the architect for the work.

A Scottish Boys' Home.—The recent army and naval display in Edinburgh brought a large sum of money to the building fund of the Soldiers and Sailors Boys' Home for Scotland. The architect for the work is Mr. Campbell, of Glasgow, but as yet the plans have not been definitely decided upon.

Sir John Wolfe Barry, K.C.B., F.R.S., has been elected to succeed the late Mr. James Mansergh, F.R.S., past-president of the Institution of Civil Engineers, as chairman of the Engineering Standards Committee, which post Mr. Mansergh had occupied since the formation of the Committee in 1901.

The Technolexicon of the Society of German Engineers.—In the compilation of this universal technical dictionary for translation purposes (in English, German and French), commenced in 1901, about 2,000 firms and individuals collaborators at home and abroad are assisting. The editor-in-chief (Dr. Hubert Jansen) will be pleased to give any information about the work. His address is Dorotheenstrasse, 49 Berlin (N.W. 7).

Usher Hall, Edinburgh.—The latest plan in connection with this building show that the dome will be dispensed with, thereby effecting a saving of £4,208. By this rearrangement the seating accommodation will be 4,000. Sir Aston Webb, Dr. Cowen and the city architect (Mr. Morham) have sent in their reports to the committee. The length of the hall will be reduced and the side galleries made narrower. A new front elevation has been prepared by the city architect and approved by the committee. According to the lowest tenders received the total cost of the hall, without the dome and exclusive of the organ, will be £130,620. This is more than the sum left by Mr. Usher.

Bow Bells are to be rehung.

A new Facade to Naples Cathedral has been completed at a cost of £260,000, and a further sum of about £16,000 is required for the towers of the building.

The Society of British Sculptors, formed about a year ago, will, it is hoped, hold its first exhibition next year. The society includes many well-known sculptors, both in and out of the Academy, and the exhibition should therefore be of great interest.

An International Building Congress at Liege is to be held from September 14th to 20th at the Universal Exhibition. The subscription to attend banquet, meetings, &c., with copies of reports and papers, is 25 francs. The secretary is M. Van Ophen, 5, Grand Place, Brussels.

For new Council Schools at Gloucester, in Derby Road, the plans prepared for the Education Committee of the city by Mr. J. Fletcher Trew, M.S.A., County Chambers, Gloucester, have been passed by the Board of Education. The schools will accommodate 700 boys and girls and 900 infants.

An Attractive Golf Clubhouse has just been completed at Cardross from designs by Mr. Alex McTurk, architect, of Helensburgh, at a cost of about £2,000. It is a two-storey brick building with freestone facings, and has on the upper storey a balcony opening from the dining-room. Cyprus wood is largely used.

The Lady Architect.—Miss McClelland recently gave an address on "A Cottage for £150" before the Women's Institute associated with the Garden City undertaking at Letchworth. Miss McClelland is the designer of one of several cottages which are being built there, the cost of the labour and materials employed in each case not to exceed £150. She strongly advocated the use of concrete.

A new Baptist School-Chapel at Shirehampton, near Bristol, has been erected from designs by Mr. B. Wakefield, architect, of 45, Nicholas Street, Bristol. Local Kingsweston stone, in "snail-creep" work left with quarry face, has been used for the external walls with Box Ground Bath-stone dressings, the walls being lined internally with brickwork and the roofs tiled. Accommodation is provided for a mixed congregation of about 300. The floor is of pitch-pine wood blocks laid on concrete, and the chapel is seated with patent "Latimer" seating. The total cost of the work was £2,044. Messrs. G. Bliss & Son, of Portishead, were the contractors. A hot-air heating system has been installed by Messrs. Haden & Son, of Trowbridge.

A Smallpox Hospital is to be erected for Harwich. It will be of corrugated iron, by Messrs. Spiers & Co., of Glasgow.

An Ancient Lincolnshire Church.—A movement is on foot at Marton, near Gainsborough, for restoring the ancient fabric of St. Margaret's Church, one of the most ancient in the county, and one of the few remaining churches with a Saxon tower. The church was last refitted in 1868.

The Ancient Parish Church of St. Bartholomew, Bayton, near Cleobury Mortimer, has been thoroughly restored and enlarged by the addition of a chancel. In the course of restoration a Norman doorway and two windows of the fifteenth or sixteenth century were found. The architect for the work was Mr. J. Oldrid Scott.

Additions to the Peebles Hotel-Hydropathic are to be made. Mr. James Miller, architect, of Glasgow, has prepared plans for an annexe showing forty-four bedrooms. Building work will be begun in October. Plans have also been prepared for a new building connected with the Hydropathic containing a complete system of electric and medicated baths. Improved recreation and billiard-rooms have also been designed.

Loughborough new Water Scheme.—The scheme to supply Loughborough with water, at a cost of over £100,000, has now reached an advanced stage. At the narrowest point of the Blackbrook Valley a solid mass of masonry, rising in some places to 40ft., stretches from hill to hill, and excavations have been made 60ft. below the surface of the brook. When completed the water in the reservoir will cover more than 100 acres of land, and upwards of 500,000,000 gallons will eventually be held up.

Wakefield Architect's Narrow Escape.—Mr. Arthur Fawcett, a well-known Wakefield architect and surveyor, recently made an extraordinary attempt on his life. When his clerk went to the office about 9 o'clock he found the door of Mr. Fawcett's private room locked, and a strong smell of gas emanating therefrom. He obtained assistance and the door was forced open, when Mr. Fawcett was discovered sitting before his desk in an unconscious and exhausted condition. In his clasped hands was a tube affixed to one of the gas jets in the room. Artificial respiration was resorted to, and in the course of an hour Mr. Fawcett was brought round sufficiently to enable him to be removed to the Clayton Hospital. Mr. Fawcett had plugged his nostrils with cotton wool, and had fastened a rug and a towel in front of the fireplace. Fortunately, however, the aperture had not been entirely covered, and the cotton wool had fallen out of the nostrils; and to these facts, no doubt, Mr. Fawcett owes his life. He had also pinned on the door a slip of paper containing the words, "Don't strike a light. Mr. Fawcett lost his wife a few years ago, and has been depressed since.

Winchester Cathedral Subsidence.—Regarding the serious subsidence of the south side of the east end of Winchester Cathedral, as already reported in our columns, Mr. T. G. Jackson, the diocesan architect, and Mr. Colson, the cathedral architect, are now satisfied that there is a sufficient thickness of gravel underlying the peat on which the building was raised to enable underpinning to be carried out, and an expert engineer is to be called in with regard to the execution of this work. Briefly, what has happened is that the streams flowing beneath the cathedral have gradually sapped the foundations on the south side, which consequently has sunk. This has thrown the arching out of equilibrium, and everything tends to make the damage worse, the weight of the roof and walls, for instance, combining to press the south wall outwards. The pressure of the displaced masonry has been so great in some places that the solid limestone has flexed like wood without breaking. The groining in the crypt has sunk so badly as to necessitate extensive shoring with timber baulks. It is thought that there will have to be a complete underpinning of the south side of the east end; buttresses erected along the walls to prevent bulging and collapse; as well as massive ties fastened through the walls to keep them together.

Bradford Town Hall Extension.—The foundation-stone of the Bradford Town Hall extension will be laid on July 28th.

Gaiety Hotel.—We regret that in describing the kitchen fitments by Mr. A. Ceresa at this hotel on p. 343 of our issue for last week "central stores" was printed instead of "central stoves."

Change of Address.—Mr. Geoffry Lucas, architect, has changed his London and country addresses to 16, Hart Street, Bloomsbury Square, London, W.C., and 23, Brand Street, Hitchin, Herts.

The Dundee Institute of Architecture held its annual meeting last week, when the awards gained throughout the year were distributed. The prize for measured drawings was awarded to Mr. D. A. Ogilvy, while the work of Mr. R. J. Thomson was commended. Mr. J. E. Robinson was the prize-winner for the drawing of a design for a cemetery chapel, while for measured drawings for pupils only Mr. E. B. Haxton was successful. The following office-bearers were elected for the ensuing session:—President, Mr. P. H. Thoms; vice-president, Mr. J. D. Mills; council, Mr. Leslie Ower, Mr. William Gauldie, Mr. Alex. Neilson and Mr. R. P. Smart; hon. secretary, Mr. David L. Allan, 41, Reform Street, and hon. treasurer Mr. Charles G. Soutar.

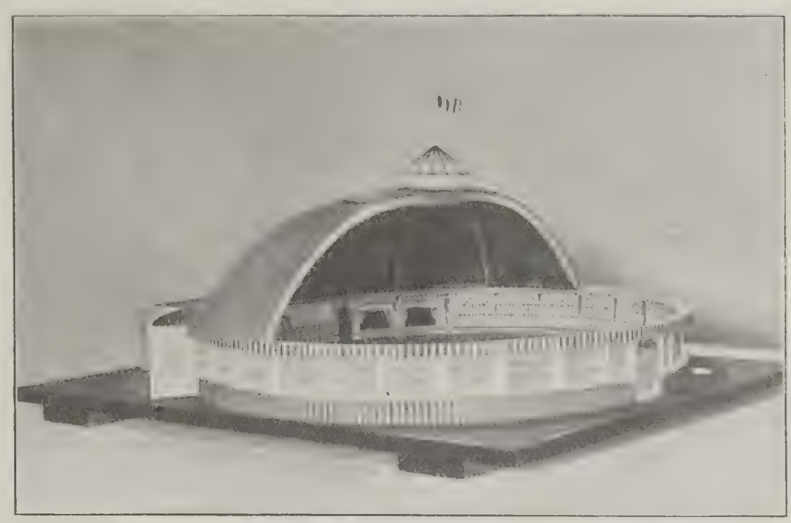
THE "AULD BRIG" OF AYR.

How it could be preserved without Rebuilding.

MR. THACKERAY TURNER, as secretary to the Society for the Protection of Ancient Buildings, has written a letter to the town clerk of Ayr stating that the committee of his Society has carefully considered the various reports which have been made upon the structural condition of the Auld Brig of Ayr, and has had the advice of a member, who is an engineer, upon the recommendations contained therein.

The committee sincerely regrets that the town council should have come to the conclusion that the bridge must be rebuilt, for it is convinced that it is possible to make the bridge structurally secure without rebuilding, in the following manner:—

The old mortar of the arches has been dissolved by water that has been allowed to leak through it, and the arches have therefore moved and lost their shape, throwing undue strain on parts of the arch stones and making them open at other parts, the distortion being increased by the haunches being overloaded. This could, the committee believes, be corrected by raking out the perished mortar, filling the joints with good cement-mortar, and driving slate wedges into the cement. If the undue weight on the haunches were then removed, the arch would take a new bearing and would be quite safe. The mortar in the piers is also perished and dissolved. This could in all probability be remedied in the same way as the barrage across the Nile was repaired, by drilling holes into the piers and forcing cement grout into them under pressure. The grout would find its way among the sand and stones and fill all vacancies and thus bind the whole firmly together. Although it is not likely that the piers would thus be turned into masses of concrete, enough would be done to make them secure. The success or otherwise of this treatment would be easily shown by the quantity of grout forced into the masonry.



MODEL OF RIDING SCHOOL.

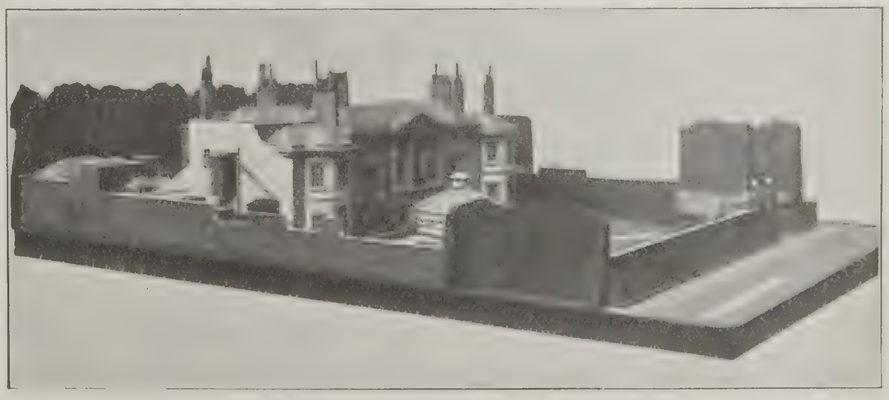
With regard to the foundations of the piers, the committee does not see that underpinning is essential. There has been some settlement of the piers such as would be expected with a clay foundation actually higher than the bed of the river, but it has not been excessive, nor is there apparently any reason to think it is increasing. All that appears to be necessary is to prevent scour round the piers and to prevent the clay foundation from squeezing under their weight into the lower bed of the river. The committee ventures to think that these ends could be gained by driving sheet-piling round each of the piers, dredging a trench 5ft. or 6ft. deep across the stream above and below the bridge, and filling with stones large enough to resist the scour of the stream, and then covering the bed between the trenches with similar stones. The letter adds that the bridge, so rendered safe for many years to come, would be Burns's Auld Brig of Ayr, whereas a new bridge would merely mark the site where the Auld Brig had been.

MODELS OF BUILDINGS.

MODELS of buildings are generally made of wood, yellow pine being principally used, as it is easiest to work, and with the aid of a circular saw the angles and joints can be fixed and set up perfectly true. The plans should be set out to the desired scale, then the main walls should be built up with wood varying from $\frac{1}{2}$in. to $\frac{1}{4}$in. thick, according to the scale of the model, gluing and fixing the angles with needle points. If the thickness of the brickwork should be required to be shown at the reveals, &c., wood or cardboard should then be fixed on the front, cutting back the door and window openings, &c. Bristol board can be used for the window frames, and a good effect of glass is obtained by cutting out the window squares, and fixing either thin gelatine or celluloid behind same, leaving either open so as to see through, or pasting black paper on the back. When the main walls of the house are fixed up and set, the roof and chimneys can then be finished off. It is advisable to make the chimneys with wood, pasting cartridge around same; this also applies to the roof; and if anyone is making a large number of models, roof lines can be ruled or printed on the cartridge beforehand. All projections, such as mouldings, window sills and cornices, should be made in either wood or cardboard, as the case requires, and glued on. It is advisable to have models for exhibitions covered with drawing paper, as they can then be coloured up effectually with water colours, but models for law cases, &c., can be left in the plain wood and coloured in different tints with distemper. When the ground surrounding the building is flat, it can be worked with wood or cardboard, but if it requires to be uneven, such as sloping paths or roadways, &c., plaster-of-Paris will need to be used, first making the original in clay, and then having it cast.

Model-making at first appears to be easy for an architect or engineer to accomplish, but unless one has had a large experience, and proper tools and materials are available, it is always advisable to place the work in the hands of a practical man, such as Mr. John B. Thorp, of the London Drawing and Tracing Office, 98, Gray's Inn Road, by whom the two models illustrated on this page were made: the one of the Riding School was made principally in cardboard, as, the walls and roof being curved, it was found easiest and quickest to work in this material; the roof principals were cut out of thin wood, so as to make a solid base for fixing the cardboard to. The model of the residence in Curzon Street, Mayfair, was made almost entirely of wood as described above.

It may be mentioned that Mr. Thorp has had more than twenty years' experience of model-making, having executed some hundreds of models for architects and surveyors.



MODEL OF RESIDENCE IN MAYFAIR.

LOW-PRESSURE HOT-WATER HEATING.

THE Institution of Heating and Ventilating Engineers is holding its summer meeting at Bristol this week. Yesterday a general meeting was held, at which Mr. D. M. Row read a paper on "Steam Economy in connection with the Heating Trade," the argument being in favour of the low-pressure hot-water system, in which temperature is secured and maintained by calorifiers through which the water constantly circulates. Mr. Row said this system was the only one affording an absolutely good and healthy atmosphere for breathing purposes, and should be adopted in all cases, especially in institutions for the aged and infirm.

Separate calorifiers should be used for the hot-water supply and for warming, so that the latter service might be entirely shut down when not required, though the former be required continuously all the year round. A suitable size steam main was provided, with branch services into each pavilion, the condensation similarly turned into a common main, and all eventually returned to the boiler. The low-pressure hot-water system might also be worked by fired boilers, but where steam was available, and in all cases where separate pavilions had to be dealt with, the application of calorifiers was more economical and advantageous in every way than separate fired boilers.

An important point in economy in connection with a calorifier system was the proper regulation and control of the steam supply. This should be governed automatically, as without a reliable automatic control there must either be considerable waste of time and trouble, in continually shutting down and re-adjusting the steam valves according to requirements, or (and this nearly always existed) a considerable waste of steam and water through valves being left open, and the water boiling away through air pipes when not required. This was obviously extravagant and wrong in principle, and there were many instances on record where the adoption of an automatic steam control had resulted in saving hundreds of pounds.

Aerating Swimming Baths.

Another subject referred to by Mr. Row was the circulating, re-filtering and aërating and re-heating of the water of swimming baths by which the temperature was maintained and the water rendered fit for use for a longer period. Here there was a double economy, as instead of running, say, 60,000 gallons to waste, re-filling the bath and heating this amount up again from cold by live steam, the same water was used over and over again and the exhaust steam from the circulating pump was utilized for re-heating. The water was drawn from the deep end of the bath and delivered to an aërator. From this the water was distributed and fell over a series of perforated plates dropping from one to the other through the atmosphere into a tank beneath. It then passed to the filter, and the filtered water in turn passed through the re-heater and finally back to the bath, entering at the shallow end. Thus the whole of the water was treated, and the operation might go on continually without interfering with the bathers. In re-heating, the exhaust steam might of course be supplemented with live steam if found necessary.

SANATORIA FOR CONSUMPTIVES.

IN the recent discussion on this subject at the Royal Sanitary Institute Mr. Edwin T. Hall said that the best position for a sanatorium was the southern slope of a gentle hill and near its summit, with tree shelter on its north, east and west. The subsoil should be sand or gravel. In any case it must be a naturally well-drained site, otherwise it would be cold, unsuitable and liable to become saturated with water. An absolutely pure water-supply was pre-eminently necessary. Sewage-disposal was of equally great importance. If there were no public sewer at hand the best alternative was a simple system of filtration and precipitation, aided by chemical infusion, into meadow land. Mr. Hall had made an extended tour amongst German sanitoria, and he had found this latter system in satisfactory use at Falkenstein. But at other sanitoria in Germany the disposal of sewage was not satisfactory. Another important matter was the location of the nurses, who should be housed off the premises. It was imperative that in all cases the wards should be made bright and cheerful, or the patient's recovery would be retarded. He did not agree with economy at the expense of efficiency, nor in temporary buildings, which were generally in the long run only an additional expense.

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
June 29	London, S.W.—Repairs, &c., to Library	Lambeth Borough Council	H. Edwards, 346 Kennington Road, S.W.
,, 29	Barnet—Church House	Trustees	J. C. Traylen, 16 Broad Street, Stamford.
,, 29	Abertillery—Alteration at Chapel	———	R. L. Roberts, Abercarn.
,, 29	Drogheda, Ireland—Residence	Guardians	Y. Dowdall, Clerk, Workhouse, Drogheda.
,, 29	Croydon—Town Hall, &c.	Council	G. F. Carter, Town Hall, Croydon.
,, 30	Weston-super-Mare—Classrooms, &c.	Education Committee	Head Teacher, Welton Council Schools, Midsomer Norton.
,, 30	Torquay—Carnegie Library	Town Council	F. S. Hex, Town Hall, Torquay.
,, 30	Cupar-Fife, N.B.—Additions to Barony	———	D. Storrar, Cupar Fife.
,, 30	Wimborne, Minster—Church House	———	W. J. Fletcher, Wimborne.
,, 30	Holbeton, near Plymouth—Dwelling-house	———	G. B. Perrott, Ringsbridge.
,, 30	Willesden—Repairs to School	Education Committee	G. E. T. Lawrence, 22 Buckingham Street, Adelphi.
July 1	Prestwick, Ayr—Twelve Houses	C. W. Andrew	A. L. Mercer, Ayr.
,, 1	Truro—Wood Block Floor	Education Committee	S. Hill, Redruth.
,, 1	Rutbin, Denbigh—Alterations to Schools	Education Committee	W. D. Wiles, 15 Well Street, Ruthin.
,, 1	Wales, near Kiveton Park—Vicarage	———	Rev. C. Ellis, Wales, near Kiveton Park.
,, 1	Glasgow—Extension of Convenience	Corporation	Office of Public Works, City Chambers, 64 Cochrane Street, Glasgow.
,, 1	Bristol—Four Workmen's Dwellings	Streets Committee	T. H. Yabbicom, 63 Queen Square, Bristol.
,, 3	Glasgow—Sub-station	Corporation	W. W. Lackie, 75 Waterloo Street, Glasgow.
,, 3	Widnes—Repairs to House	———	J. S. Sinclair, Borough Surveyor, Widnes.
,, 3	Tipton—Alterations to Schools	Education Committee	A. Long, 21 New Street, West Bromwich.
,, 3	Brompton, near Northallerton—Extension of Mills	W. J. Pattison	T. Winn & Sons, 92 Albion Street, Leeds.
,, 3	Burnham, Bucks—New Rooms, &c., at School	Managers	Burnham Mixed School.
,, 3	Glasgow—Sub-stations	Corporation	W. W. Lackie, 75 Waterloo Street, Glasgow.
,, 3	Rhydsaddler, near Ponterwyd—Stone Bridge	Rural District Council	H. Hughes, 8 Market Street, Aberystwyth.
,, 3	Teignmouth—Hospital, &c.	Urban District Council	G. F. Gettings, Town Hall, Teignmouth.
,, 4	London—Converting House into Dressing-rooms, &c.	London County Council	Superintending Architect's Department, 15 Pall Mall East, S.W.
,, 4	Willesden—Cottage	District Council	O. C. Robson, Public Offices, Dyne Road, Kilburn, N.W.
,, 4	Helen's Bay, co. Down—Villa	Mr. G. F. Shanks	Hobart & Heron, 124 Scottish Provident Buildings, Belfast.
,, 5	Eccles—Forty-six Semi-detached Houses	Corporation	E. Parkes, Town Hall, Eccles.
,, 5	London, S,E.—Additions to Southwark County Court	Commissioners	H.M. Office of Works, Storey's Gate, S.W.
,, 5	Bristol—New Schools	Education Committee	W. B. Wood, 12 Queen Street, Gloucester.
,, 5	Prestwick, Ayr—Six Pairs of Semi-detached Cottages	Wyllie & Co.	A. L. Mercer, Ayr.
,, 6	Gainsborough—School	Education Committee	Scorer & Gamble, Bank Street Chambers, Lincoln.
,, 10	Sudbury—Sanitary Annexes	Guardians	Workhouse, Sudbury.
,, 11	Bethnal Green—Chimney Shaft	Council	Borough Engineer, Town Hall, Bethnal Green, N.E.
,, 12	London, N,W.—Vaccine Station	Commissioners	J. B. Westcott, H.M. Office of Works, Storey's Gate, S.W.
,, 13	Omagh, Ireland—Gallery	———	Omagh District Asylum.
,, 15	South Brent, Devon—Alteration to School	Education Committee	S. Brent, Council School.
Aug. 1	Buckingham—New Royal Latin School	Governors	Town Hall, Buckingham.
No date	Westcliff-on-Sea—Temporary Church	———	W. Gale-Hasleham, Roseneath, Palmerston Road, Westcliff-on-Sea.
	ENGINEERING:		
June 29	Elgin—Reservoir	———	John Wittet, Architect, Elgin.
,, 30	Burton-upon-Trent—Tramways ($1\frac{3}{4}$ miles)	Corporation	Walker, Manville & Dawson, 29 Great George Street, Westminster.
,, 30	Rothbury, Northumberland—Water-supply Works	Guardians	A. Snaith, Bolam House, Rothbury.
July 1	Leigh, Lancs—Boiler	———	A. T. Smith, Electrical Engineer, Leigh.
,, 1	Cwm Penmachno, Wales—Reservoir	Rural District Council	J. Hughes, Borough Surveyor, Ruthin.
,, 1	Eastham, Tenbury—Bridge Works	Rural District Council	R. W. Jarvis, Kyreside, Tenbury.
,, 3	Horncastle—Repair of Four Bridges	Rural District Council	Council Offices, Horncastle.
,, 3	Brighton—Storage Battery, &c.	Town Council	H. Talbot, Town Hall, Brighton.
,, 3	Ashbourne, Derbyshire—Waterworks	Rural District Council	H. W. Taylor, St. Nicholas Chambers, Newcastle-on-Tyne.
,, 3	Barking—Sluice	Sewers Commission	A. H. Case, Broad Sanctuary Chambers, S.W.
,, 3	Luddendenfoot, near Halifax—Bridge	West Riding County Council	County Surveyor, County Hall, Wakefield.
,, 3	Milton-next-Sittingbourne—Saturator	Urban District Council	J. Watson, Gasworks, Milton.
,, 3	Nelson, Lancs—Bridge, &c.	Plans and Building Committee	B. Ball, Borough Engineer, Nelson.
,, 3	Llantwit Major, Wales—Waterworks	Cowbridge R.D.C.	Kirkby Son & Brown, Stone Chambers, Newport, Mon.
,, 4	Mitcham, Surrey—Boiler	Guardians	J. A. Battersby, Holborn Union Offices, 53 Clerkenwell Road, E.C.
,, 5	Naas, Ireland—Meters	Rural District Council	F. Bergin, 36 Westmoreland Street, Dublin.
,, 6	Hexham—Sewerage, &c., Works	Rural District Council	J. E. Parker, Post Office Chambers, Newcastle-on-Tyne.

Builders' Notes.

Dublin Building Trade Dispute: Arbitration agreed to.—The Dublin Bricklayers' Society and the master-builders have agreed to Alderman Cotton being appointed as arbitrator to settle the dispute between them.

Scottish Building Trades' Exhibition.—Mr. H. Greville Montgomery, of the International Building Trades' Exhibition, writes stating that he has no connection whatever with a Scottish building trades' exhibition which is being undertaken owing to "the encouragement given by the increasing success of the London enterprise."

London Building Acts (Amendment) Bill.—In giving evidence recently before the Select Committee of the House of Commons considering this measure Captain Hamilton, Chief Officer of the London Fire Brigade, stated that shop roofs should be made of fire-resisting materials and windows in the roof should not occupy more than a tenth of the whole. Supposing all the clauses of the Bill passed, there would be no special arrangements required for buildings under 25ft. in height, and houses from 25ft. to 50ft. in height would be required to have parapets and access to the roof. In buildings over 50ft. in height there should be means of escape from each floor. The provision requiring that wells of lifts should be constructed of fireproof material would not come into force for seven years. The danger from lifts in case of an outbreak of fire was very great. Much mischief arose from windows in adjoining buildings, and when windows were opposite at a distance of 15ft. a provision in the Bill required the use of fire-resisting glazing in new buildings. On all these points he had advised the Council that precautions were urgently required.

Law Cases.

A Quantity Surveyor's Fees.—In the Lord Mayor's Court in the city of London Mr. Earl, architect and quantity surveyor, recently sued Mr. Griffin, of Coleman Street, also an architect, who was employed by one Brown in connection with the building of the Whitfield Institute, for £88, the balance of an account for services rendered. The plaintiff said that he was employed by the defendant to carry out certain quantity surveying work. He had been paid a sum of £7 on account of the moneys due to him, and had given I O U's. Upon applying for the balance in February last, the defendant said he had no money, and that he was afraid to ask his employer for any as he did not want to offend him. The defence was that the plaintiff was employed on the terms that he was not to be paid until the defendant had been paid. Upon receiving the £7 the plaintiff gave not a receipt on account, but I O U's. A counterclaim was raised by the defendant for damages for the detention of certain documents. The plaintiff, it was alleged, had broken the contract by not completing the work and by refusing to deliver the work he had done. The plaintiff was not entitled to recover his fees because at that time he (defendant) had not received them from his employer. A verdict was entered for the defendant on the claim and on the counterclaim for the return of the documents, or £1 damages and for £7 money lent.

Ancient Lights.—The case of *W. Neal* v. *W. H. & T. J. Horniman & Co.* recently came before the Common Serjeant in the Lord Mayor's Court in the city of London. The plaintiff, a restaurant proprietor, of 8, Wormwood Street, claimed damages for injury caused to his business by reason of the defendants carrying a building opposite to a greater height than it was before. The defendants' premises were opposite to those of the plaintiff, who held his on a fourteen years' lease, of which seven years and a quarter were unexpired. The width between the two houses was 24ft. 11ins. In December, 1904, the defendants were rebuilding their premises, No. 27, Wormwood Street, and a portion was carried to 20ft. higher than before. This, it was said, made the plaintiff's premises darker, and so injured his business. The premises had the protection of "ancient lights." For the defence it was denied that the alteration had resulted in any diminution of light. It was stated that the actual height by which the wall had been raised was 16ft. The jury found for the plaintiff, and awarded him £15.

Coming Events.

Wednesday June 28.

BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.—Half-yearly Meeting of Directors at 8 p.m.

SOCIETY OF ARTS.—One hundred and fifty-first Annual Meeting. Election of Officers and new members, 4 p.m.

CHURCH CRAFTS LEAGUE (Church House, Dean's Yard, S.W.)—Meeting at 8 p.m.

Thursday, June 29.

SOCIETY OF ANTIQUARIES.—Meeting at 8.30 p.m.

INSTITUTE OF SANITARY ENGINEERS.—Visit to the Works of Messrs. Doulton & Co. at Lambeth, at 2.30 p.m.

Saturday, July 1.

ARCHITECTURAL ASSOCIATION. — Fourth Summer Visit to Audley End. Leave Liverpool Street, 1.23 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to Inchcolm

Monday, July 3rd.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—General Meeting to discuss amendments to the Regulations for Architectural Competitions, at 8 p.m.

Tuesday, July 4.

SOCIETY OF ARTS.—Conversazione in the Gardens of the Royal Botanic Society, Inner Circle, Regent's Park, W., from 9 p.m. to 12 p.m.

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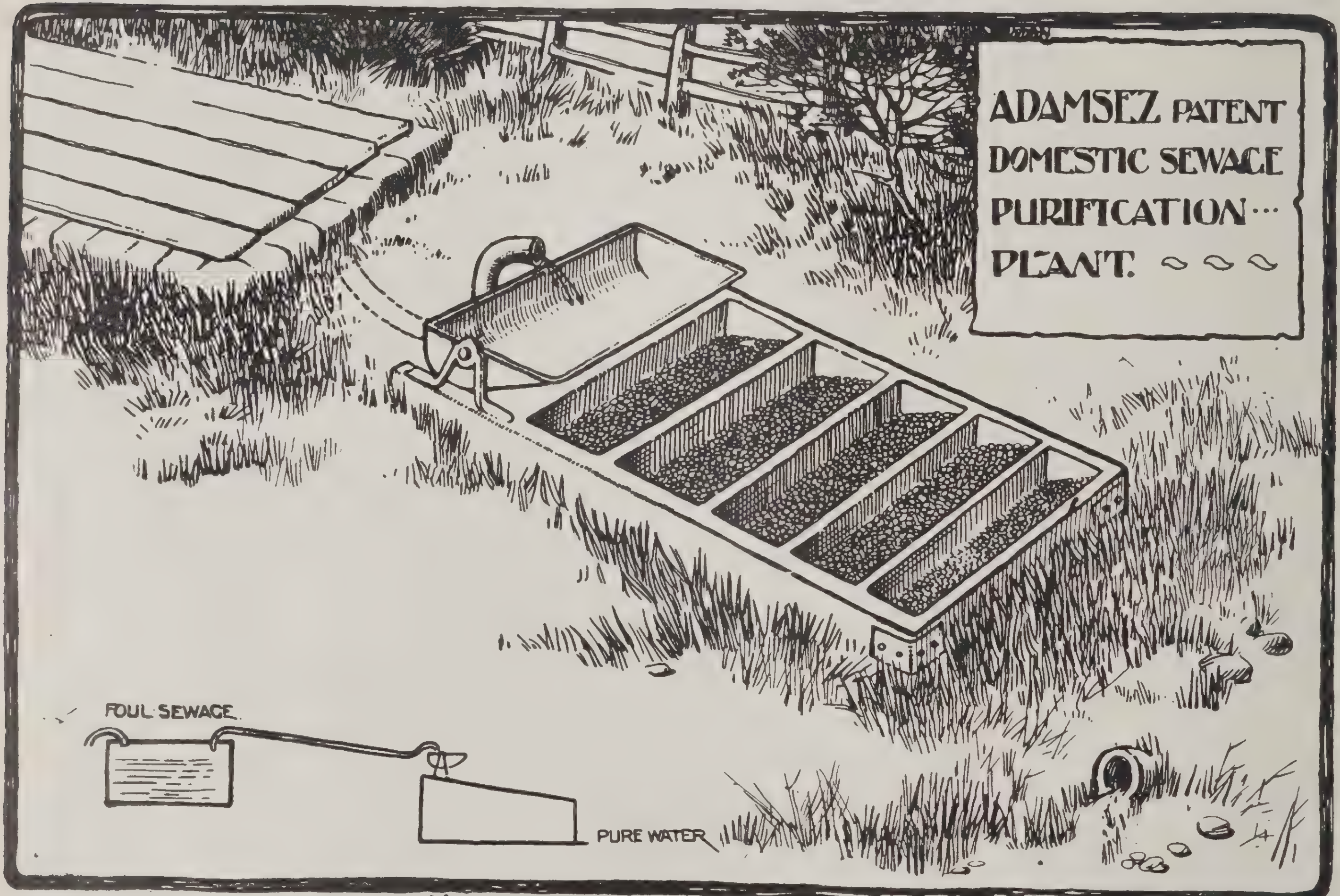
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Complete List of Contracts Open.—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	ENGINEERING—*cont.*		
July 8	Sleaford, Lincs—Water-supply	Rural District Council	W. B. Marsden, 74 Southgate, Sleaford.
,, 11	London, S.E.—Engineering Alterations	Metropolitan Asylums Board	Offices of Board, Embankment, E.C.
,, 11	Cardiff—Motor Fire-engine	Corporation	Chief Constable's Office, Westgate Street, Cardiff.
,, 11	London, S.W.—Roadwork and Plate-laying for Electric Traction on Tramways.	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W
,, 15	Belfast—Heating, &c., Institute	Library and Technical Instruction Committee.	S. Stevenson, 83 Royal Avenue, Belfast.
	IRON AND STEEL:		
June 29	Chatham—Iron Fencing	Town Council	Charles Day, Town Hall, Chatham.
,, 29	Darlington—Cast-iron Pipes	Corporation	G. Winter, Town Hall, Darlington.
July 3	Pontypridd—Iron and Steel	Urban District Council	E. Jones, Gasworks, Treforest, near Pontypridd.
,, 4	Halifax—Brass Lamp Fittings, &c.	Gasworks Committee	J. Wilkinson. Gasworks, Halifax.
,, 6	Salford—Iron and Steel	Gas Committee	W. W. Woodward, Gas Offices, Bloom Street, Salford.
,, 7	Cricklewood, Middlesex—Pipes and Castings	Metropolitan Water Board	Office of Board, The Firs, Southern Road, Fortis Green
	PAINTING AND PLUMBING:		
June 29	London, S.E.—Painting, &c., Library	Lambeth Borough Council	H. Edwards, 346 Kennington Road, S.E.
,, 29	Sidcup, Kent—External Painting Work	Guardians	Clerk's Office, Workhouse, East Greenwich.
,, 30	Swansea—Painting at School	Education Committee	Education Offices, Dynevor Place, Swansea.
,, 30	Runcorn—Painting, &c., Church	——	T. H. Annett, Trinity School, Runcorn.
July 1	Bridlington—Painting at Grammar School	——	Head Master, School House, Bridlington.
,, 1	Bradford—External Painting of Nurses' Home	Guardians	F. Holland, 11 Parkinson's Chambers, Hustlergate, Bradford.
,, 3	Ecclesfield—Painting, &c., at Schools	County Council	W. Hague, Ecclesfield.
,, 3	Hastings—Oil	Corporation	P. H. Palmer, Town Hall, Hastings.
,, 6	Salford—Leadpipe, Paints, Brushes, &c.	Gas Committee	W. W. Woodward, Engineer, Gas Offices, Bloom Street, Salford.
,, 7	Merthyr Tydfil—Painting at School	Urban District Council	G. Jenkins, Clerk of Works, Merthyr Tydfil.
,, 10	Ipswich—Painting and Decorating Work	Education Committee	E. F. Johns, Thoroughfare, Ipswich.
,, 14	East Ham—Whitewashing, &c.	Education Committee	Education Office, East Ham.
No date	Gateshead—Painting at Schools	Education Committee	Education Office, Gateshead.
	ROADS AND CARTAGE:		
June 29	New Barnet—Road Materials	Urban District Council	H. Yorke, Surveyor, New Barnet.
,, 29	Ramsgate—Making-up Roads	Corporation	T. G. Taylor, Albion House, Ramsgate.
,, 30	Branksome, Dorset—Road Materials	Urban District Council	S. J. Newman, Council Buildings, Branksome, Parkstone.
July 1	Faversham—Road Materials	Corporation	Town Clerk's Office, Faversham.
,, 1	St. Albans—Making-up Roads	——	Rumball & Edwards, St. Peter's Street, St. Albans.
,, 1	Walton-on-Thames—Making-up Road	Urban District Council	U.D.C. Offices, Walton-on-Thames.
,, 3	Nelson, Lancs—Flagging	Education Committee	B. Ball, Borough Surveyor, Nelson.
,, 3	Sunbury-on-Thames—Road Materials	Urban District Council	H. F. Choales, Surveyor, Sunbury.
,, 3	Seaford, Sussex—Road Materials	Urban District Council	W. H. Pawson, 3 Clinton Place, Seaford.
,, 4	Willesden—Paving Works, &c.	District Council	O. C. Robson, Public Offices, Dyne Road, Kilburn.
,, 4	Brentford—Paving, &c.	Urban District Council	N. Parr, Clifden House, Boston Road, Brentford.
,, 5	Rochester—Road Metal	Corporation	William Banks, City Surveyor, Rochester.
,, 10	Heath Town, near Wolverhampton—Street Works	Urban District Council	Berrington & Son, 28 Victoria Street, S.W.
	SANITARY:		
June 30	Wolverhampton—Sanitary Pans	Corporation	Manager, Team Department, Crown Street, Wolverhampton.
July 1	Ashby-de-la-Zouch—Sewerage Works	Urban District Council	Walker & Son, Albion Street, King Street, Nottingham.
,, 1	Boughton Aluph, Kent—Scavenging	Parish Council	Mr. Hemmings, School House, Boughton Aluph.
,, 1	Newburn-on-Tyne—Sewers	Urban District Council	T. Gregory, Engineer to Council, Newburn-on-Tyne.
,, 3	Hastings—Sanitary Rolls, &c.	Corporation	P. H. Palmer, Town Hall, Hastings.
,, 4	London, S.E.—Sewers	London County Council	Maurice Fitzmaurice, County Hall, Spring Gardens, S.W.
,, 10	Dalton-in-Furness - Drainage Works	Education Committee	W. Butler, Elementary Education Offices, Dalton.
,, 10	Haddington, N.B.—Sewers	Town Council	Leslie & Reid, 72A George Street, Edinburgh.
	TIMBER:		
June 30	Worcester—Wood Blocks	Corporation	T. Caink, Guildhall, Worcester.
July 6	Salford—Timber	Gas Committee	W. W. Woodward, Gas Offices, Bloom Street, Salford.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
July 1	Bexhill, Sussex—School	£50, £30 and £20	£1 1s.	Secretary, Education Committee, Amherst Road, Bexhill.
Aug. 1	Hove, Sussex—Library	£50, £30, £20	£1 1s.	H. Endacott, Town Hall, Hove.
,, 1	Perth—Reconstruction of Hall	30, 20 and 10 guineas	——	J. Begg, City Chambers, Perth.

* *Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).*

PERFECTION
IN
Spring Hinges

The "VICTOR" Double Action Spring Hinges open wider than any other—viz., 135° each way, *i.e.*, 45° beyond right angles—and close with a perfect check action.

ROBERT ADAMS,
PATENTEE,
3 & 5, Emerald Street,
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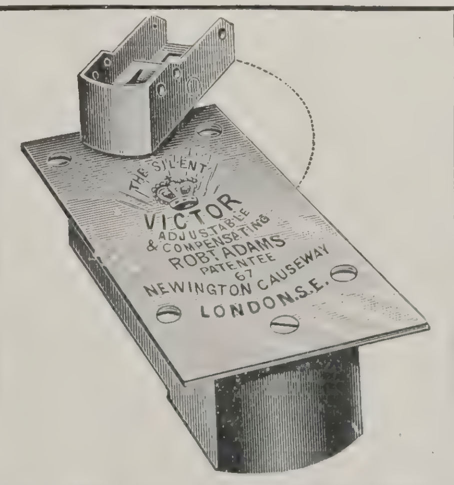

The "Crown Victor" showing opening capacity.

Guaranteed
THE BEST
Spring Hinges
in the world.

The "VICTOR" Single Action Spring Hinges open wider than any other—opening to and closing from the angle of 180°, *i.e.*, the half circle, with a perfect check action.

ROBERT ADAMS,
PATENTEE,
3 & 5, Emerald Street,
Theobald's Road, W.C.
Telephone: 829 Central.

Advertising Notes.

The only way to make things come your way is to go after them early and often—for instance, once a week in the "Builders' Journal."

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterward, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Monday.

ARCHITECT and SURVEYOR'S ASSISTANT (23), 7 years' general experience, working drawings, specifications, quantities, levelling, surveying, &c. First-class testimonials. Certificates, Honours Building Construction, Architecture, &c. — Box 1166, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT and SURVEYOR'S ASSISTANT DISENGAGED. Twelve years' good general experience, quick and accurate draughtsman. Working and detail drawings, designs, surveys, specifications. Splendid testimonials. Salary moderate—A. R., Hazlemere, Rusham Road, Egham, Surrey. 1162

ARCHITECT and SURVEYOR'S ASSISTANT desires ENGAGEMENT; 12 years' experience in all branches of the profession, including Specifications, Quantities, Surveying, Levelling, &c.—Apply Box 1180, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S and SURVEYOR'S JUNIOR ASSISTANT (21) requires ENGAGEMENT. Working and detail drawings; good references: moderate salary.—Box No. 1191, Builders' Journal Office, 6, Great New Street, London. E.C.

ARCHITECT and SURVEYOR'S ASSISTANT, 22; 6 years' experience, desires ENGAGEMENT, working drawings from rough sketches, perspectives, surveying, levelling, good tracer, colourist, general office routine. Salary moderate.—Box 1206, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT and SURVEYOR'S ASSISTANT desires ENGAGEMENT; age 23; 6 years' London and Provincial experience, design, working and detail drawings, specifications, surveying, and levelling, &c.; neat draughtsman; excellent testimonials, moderate salary. — Reply Box 1198, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S ASSISTANT DISENGAGED. 7 years' good experience (24). Good construction, details, surveying and levelling, &c; fair knowledge quantities. Moderate salary; good references. —F. G. R., 63, Pagoda Avenue, Richmond. 1175

ARCHITECT'S ASSISTANT (24) desires ENGAGEMENT. Good draughtsman. Designs, working drawings, details, perspectives, specifications; nine years' experience.—W. H. L., 83, Elspeth Road, Clapham Common, S.W. 1210

ARCHITECTURAL ASSISTANT (26) wants POSITION in architect's (or engineer's) office. Seven years' experience. Working drawings and details, surveying, perspectives, etc.—A. E. P., 35, Carpenter Road, Edgbaston, Birmingham. 1189

ARCHITECT'S CLERK (22) seeks EMPLOYMENT. Good tracer; assist in surveying. 7 years' experience. Good ref.—C. L., 11, Herries Street, Queen's Park, London, W. 1165

ARCHITECT'S DRAUGHTSMAN wants SITUATION in office or works; eight years' experience; north preferred; 35s. salary.—Box 1164, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S JUNIOR ASSISTANT (22) requires ENGAGEMENT in London. Salary 25s. Working and detail drawings. Measuring old work. Knowledge of surveying, &c. Good references.—E. J. C., "Beaconsfield," Kew Green, Surrey. 1176

BUILDER'S ASSISTANT desires ENGAGEMENT. Well up in accounts, prime cost, measuring, and usual office routine. Assist estimating and quantities.—F. J. L., 53, Maidstone Road, Chatham. 1167

BUILDER'S CLERK, experienced, double entry book-keeping, time sheets, correspondence and general routine. Plans, &c. Town or country. Moderate salary.—E. W. H., 11, Archibald Road, Tufnell Park, N. 1177

BUILDER'S CLERK (26) requires SITUATION; estimating, quantities, drawing; moderate salary.—H. D., 3, Mildmay Road, Romford. 1169

BUILDER'S, &c. CLERK OF WORKS ASSISTANT (22); drawing, tracing, knowledge quantities and details; 4½ years in architect's office; certificates, building construction, advanced, 1st freehand, &c.—H. M. N., Thorncroft, Farnham, Surrey. 1187

COMPETENT ASSISTANT desires ENGAGEMENT; 12 years' first-class experience; various branches of architectural work; town or country. Excellent testimonials.—S., 76, Belsize Road, N.W. 1158

CARPENTER and JOINER with 16 years' experience, wants piecework labour only or as working foreman; good references; distance no object; estimates given.—Apply, D. W., 58, Wellington Street, Gravesend, Kent. 1208

ESTATE CLERK of WORKS seeks ENGAGEMENT. Plans, measurements, accounts. Long experience. Country preferred. Good references. —Address Box 1159, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

GENERAL or WORKING FOREMAN, shop or outside, conversant with allied trades, reliable and steady; country preferred.—Harry Hems, 7, Park Grove, Bromley, Kent. 1200

HOT WATER FITTER requires SITUATION; good references; has taken charge of work.—T. S., 70, Gordon Road, Ilford. 1179

IMPROVER requires ENGAGEMENT. 4½ years' experience. Good draughtsman, &c.; moderate salary.—Apply, H. Luckman, St. Andrew's Road S., St. Anne's-on-the-Sea. 1174

JUNIOR ASSISTANT disengaged; smart draughtsman, tracer, colourist: salary 20s.—Address Monnion, 219, Brixton Road, S.W. 1182

MACHINIST, YOUNG, seeks JOB as IMPROVER on Sawbench or Planer. Good Refs. Wages moderate. London preferred.—A. A., Brooklyn House, Bell Lane, Hendon, N.W. 1204

PLUMBER.—Reliable Man REQUIRES JOB or CONTRACT for Sanitary Work.—W. Phillips, 9, Selwood Street, Rotherhithe, S.E. 1209

TIMEKEEPER and MATERIAL CLERK seeks RE-ENGAGEMENT. Highest references from large builders and railway contractors. Pay sheets, abstracts, &c. Age 33.—Address 29, Penn's Road, Pet field, Hants. 1163

TO ARCHITECTS.—QUANTITY SURVEYOR wishes to MANAGE SURVEYING BRANCH for busy firm of Architects, where he could do their work at a fixed salary, and undertake other work on profit-sharing terms. Advertiser has small capital at command if required.—Box 1207, Buirders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

YOUNG ARCHITECT, some time in practice in the north of Ireland, desires to meet Architect with view to partnership. Fifteen years' experience in best offices.—Box 1178, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

YOUNG MAN (22), with eight years' experience in building trade, good draughtsman, desires ENGAGEMENT in any capacity where former experience would be of value and opportunity for advancement. Willing to pay small premium.—G. A., 31, Langham Road, West Green, N. 1160

Appointments Vacant.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterward, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Monday.

MARBLE. — CAPABLE WORKING FOREMAN wanted to take charge of Mason's Shop in London. Used to machinery, setting out and estimating cost of work. Must be good manager of men. Permanency for suitable applicant.—Apply, stating age, former experience and wages required to "Marble," Box 1199, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

STONE CARVERS WANTED. Hard Stone. Good men only.—F. G. Floyd, Sculptor, Ardwick, Manchester.

TRAVELLERS.—WANTED, by Paperhangings Manufactory, TRAVELLERS for parts of the United Kingdom, also abroad. Only those who have a large connection amongst first-class builders and merchants need apply. Undeniable references necessary. —Write "Alpha," c/o J. W. Vickers, 5, Nicholas Lane, E.C.

WANTED at once, WALKING FOREMAN, accustomed to concrete paving and fireproofing work. Must be smart, early riser, and equal to controlling men. Preference to one conversant with centreing. Liberal terms and permanency to suitable man. State age and experience, which must be genuine. —Box 1173, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

WANTED, Experienced ESTIMATING CLERK and ASSISTANT in Builder's office, apply stating age, wages, &c., to "Midlands," Box 1170, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

Drawings, Tracings &c.

ARCHITECTURAL DRAUGHTSMAN desires to ASSIST during his spare time in the preparation of contract or competition drawings. Ten years' London experience. Moderate charges.—E. C., 100, Archway Road, N. 1205

DESIGNS for SUBURBAN RESIDENCES prepared to suit clients. Plans and Specifications for new work and alterations. Drain Plans at specially low fees.—J. Lawrance, jun., M.R.S.I A.I.S.E., 112, Shirland Road, W.

HOSPITALS and SCHOOLS.—EXPERT ASSISTANCE on designs. Highly successful in competitions. Moderate and speculative terms.—Boughton, "Woodlands," Ryde. 1188

PERSPECTIVES EFFECTIVELY EXECUTED.—C. H. Simpson, 82, Ebury Buildings, Ebury Square, S.W. 1190

Businesses Wanted & For Sale.

ARCHITECT and SURVEYOR wishes to purchase an old-established practice or Partnership in a good firm.—Full particulars in strict confidence to "Practice," Box 1186, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

OLD ESTABLISHED SANITARY ENGINEERING BUSINESS FOR SALE, with high-class connection.—Address, c/o Sanitary Association, County Chambers, Gloucester.

TO SANITARY ENGINEERS, PLUMBERS or DECORATORS. A small old-established BUSINESS for SALE, in leading position of a country town, about 18 miles from London. Splendid opening for energetic man, who, with personal superintendence, could double returns. Good railway accommodation.—Box 1203, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

Offices &c. Wanted & To Let.

SHARE OF OFFICES.—An Architect with offices adjoining Bedford Row can accommodate another. Terms £18.—Box 1201, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

Miscellaneous.

FACTORIES OR WORKSHOPS and 14 STALL STABLING with large WHARF on the Grand Junction Canal to be LET on LEASE or to be SOLD. Frontage to canal 684ft., average depth 80ft.; close Willesden Junction; rent £500 per annum, or £2,200 for Lease of 13 years at £150 ground-rent.—Full particulars of H. Budd, 2, Coleman Street, City.

GRANO-CONCRETE WORK.—WANTED by Practical and Reliable man castings of every description: Situ Stairs, Paving, Fireproof Floors, Partitions, &c.; labour only or would take charge.—E. E., 48, Reaston Street, New Cross, S.E. 1143

JOINERY.—JOINERY REQUIRED of any description, any quantity, at competitive prices.—Apply E. J. Clayton, Steam Joinery Works, 144, Uxbridge Road, Shepherd's Bush. 1181

LEADING FIRM, having large West-end Showrooms for Art Metal Fittings, is prepared to undertake the SALE of ARCHITECTURAL and ELECTRICAL FITTINGS of recognised merit on a commission basis.—Apply Box No. 1193, Builder's Journal Office, 6, Great New Street, Fetter Lane. E.C.

MARBLE AND GRANITE WORK. Speciality, Shopfittings, Steps, and Monuments.—Kelly & Co., Masons, Mill Hill, N.W., also Kilburn N.W., and Harpenden, &c. Telephone, 1159 Hampstead.

PAPERHANGING.—Every description undertaken in any quantity. First-class workmanship. Moderate charges. Prompt attention. Town or country. —F. Stevens, 29, Buckingham Road, Harlesden, N.W. 1161

PURLEY.—BUILDING LAND in the best part of this delightful district. A new and well-made road has just been completed on Furze Hill, six minutes from station and electric tram terminus, with magnificent views and agreeable surroundings. Sites suitable for private residences with good gardens. Sewer, surface water drain; gas and water laid on. No tithe, land tax or fencing. A reduction in the price will be made to a builder taking several plots.—Plan and particulars of Mr. W. L. Winborn, Keeper's Cottage, Furze Lane, Purley.

SEE PAGES XV and XX FOR EMPLOYMENT REGISTER.

WORKING or COMPETITION DRAWINGS, PERSPECTIVES, TRACINGS,
PHOTO-COPIES, All kinds of copies, including PERMANENT BLACK LINE on CARTRIDGE or LINEN. MODELS OF BUILDINGS, WORKS, ETC., LITHO-PRINTING.
THE LONDON DRAWING & TRACING OFFICE, (Estd. 1883.) 98, Gray's Inn Road, W.C. (Adjoining Holborn Town Hall.)
Telephone, No. 1011 HOLBORN. Manager—JOHN B. THORP. Telegrams: "DIVIDITORE," LONDON.

SPECIAL NOTICE.

We would call our readers' special attention to the following letter which was received by us on Monday, the 26th inst.:—

June 23, 1905.

In THE BUILDERS' JOURNAL for the last week in May I noticed an advertisement of a fountain pen. On May 30th I forwarded a postal order for one of these pens to the advertisers, Messrs. Newton & Co., 63, Aldermanbury, E.C. I have since heard nothing from them. On June 8th I wrote to them asking if they had received my letter—no answer whatever. Again on June 19th, I wrote—still no answer.

This morning I have the two last letters returned by the General Post Office as "Undeliverable," but I notice that the letter with money in it was deliverable.

I don't know what this means, but I see that the advertisement still appears, and the address is the same as the one which is unfindable. As I can't get a letter through to the advertisers, I should like to know if you have any other address to which I can write to these people, or could I in any way communicate with them through you? I enclose stamped and addressed envelope, and shall be much obliged to you if you will answer this at your earliest convenience.

We greatly regret to hear of this occurrence, and our enquiries at their address lead us to conclude that Messrs. Newton & Co. have disappeared. We should be glad if any other of our readers who have had unsatisfactory dealings with this firm would communicate with us, as we shall be pleased to send them any information we may receive from the authorities with whom we have communicated.

Educational.

R.I.B.A., SOCIETY OF ARCHITECTS AND CIVIL SERVICE TECHNICAL EXAMINATIONS, preparation by correspondence or residence. 29 first places.—G. A. T. MIDDLETON, 19, Craven Street, Strand.

QUANTITIES.—A course of Correspondence Lectures in this subject (on the London system) is now ready. Also Lectures in Estimating.—For particulars apply Box 632, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

R.I.B.A. EXAMS.—Personal and Correspondence tuition; courses of any duration. Apply for syllabus to Mr. A. G. BOND, B.A. Oxon., A.R.I.B.A., 115, Gower Street, London, W.C. (late Howgate and Bond).

STRUCTURAL STEELWORK

Correspondence Classes specially for Architects, Assistants, Surveyors, Builders, and Draughtsmen, by the MIDLAND ENGINEERING BUREAU, STRAND, DERBY. Specialists in American and Continental Construction. Thorough Tuition. Send for descriptive booklet J., and read opinions of past students, and press notices, &c.

THE ARCHITECTURAL ASSOCIATION.

July 1st. Fourth Summer Visit to Audley End. P.O, 6s. (including rail and tea) to be sent to the Secretary at 18, Tufton Street, Westminster, before June 28th. Members to meet at Main Line Booking Office, Liverpool Street Station, at 1.0 p.m. for the 1.23 p.m. train.

THE ARCHITECTURAL ASSOCIATION SKETCH BOOK.

First quarterly part of new volume just issued. Published by subscription at One guinea per annum (72 plates 18 in. by 13½ in.), containing reproductions of some of the finest specimens of measured drawings and sketches. Sample plates and subscription form may be obtained post free on application to the Secretary, at 18, Tufton Street, Westminster.

HENRY TANNER, Jr., } Hon. Secs.
A. MARYON WATSON, }

To Contributors.

THE EDITOR will be pleased to consider any articles, illustrated or otherwise, dealing with old and new buildings, methods of construction, or other matter of an architectural character. He will also be glad to consider architectural photographs and sketches (the latter preferably in black and white) and measured drawings of work in this country or abroad. News items of interest to architects and builders will also be considered, provided the name and address of the sender are given; no notice will be taken of anonymous contributions. All communications should be addressed to the Editor of THE BUILDERS' JOURNAL, 6, Great New Street, E.C.

Contracts Open.

BRENTFORD URBAN DISTRICT COUNCIL.

CONTRACTS FOR PAVING WORKS.

The Council are prepared to receive TENDERS for:—

(a) The LAYING of about 4,145 square yards of CREOSOTED FIR WOOD BLOCK PAVING in the streets called Half Acre and Boston Road (main roads), beside tramway track, together with the necessary kerbing, &c., and

(b) The FORMATION and PAVING of a FOOTPATH on the west side of the street called Half Acre, with Patent Victoria Stone Paving, together with the necessary kerbing, channelling, &c.

Forms of Tender (on which alone Tenders will be received) may be obtained, and the plans, specifications, and conditions inspected at the office of Mr. NOWELL PARR, C.E., the Engineer and Surveyor to the Council, Clifden House, Boston Road, Brentford, between the hours of TEN a.m. and FIVE p.m. (except Saturdays).

Tenders to be delivered (sealed) at the CLERK'S office, 209, High Street, Brentford, on or before TUESDAY, the 4th day of JULY next, not later than TWELVE o'clock noon, marked "Tender for Wood Paving," or "Tender for Footpath," as the case may be.

The Council do not bind themselves to accept the lowest or any Tender, and the person whose Tender is accepted will be required to pay not less than the trade union rate of wages current in the district, and to employ local labour as far as possible in carrying out the work.

By Order,
STEPHEN WOODBRIDGE,
Clerk.

Brentford,
June 20th, 1905.

BOROUGH OF BETHNAL GREEN.

TO BUILDERS AND CONTRACTORS.

The Council invite TENDERS for the ERECTION of a BRICK CHIMNEY SHAFT 60 feet high.

Plans and specification can be seen upon application to the BOROUGH ENGINEER between the hours of TEN a.m. and FOUR p.m., and copies of the bills of quantities and form of Tender obtained upon payment of £2 2s., which will be returned upon receipt of a bonâ fide Tender.

The Contractor must pay such rate of wages and observe such hours of labour as are recognised by the trade unions in the locality where the work is done.

Tenders, sealed and marked "Chimney Shaft," are to be delivered with the bills of quantities fully priced out to the undersigned not later than TWELVE NOON on TUESDAY, the 11th of JULY, 1905.

The Council does not bind itself to accept the lowest or any Tender.

By Order,
ROBERT VOSS,
Town Clerk.

Town Hall,
Bethnal Green, N.E.
21 June, 1905.

BOROUGH OF TORQUAY.

CARNEGIE LIBRARY.

The Torquay Town Council invite TENDERS for the ERECTION of the above-mentioned BUILDING.

Contractors desirous of submitting Tenders can obtain bills of quantities and form of Tender on application to the undersigned, accompanied by a deposit fee of Five guineas, which will be returned on receipt of a bonâ fide Tender.

All applications must be made before the 30th JUNE, 1905.

The Council do not bind themselves to accept the lowest or any Tender.

FREDK. S. HEX,
Town Clerk.

Town Hall, Torquay,
June 19th, 1905.

EMPLOYMENT REGISTER.

Too late for Classification.

1204.—MACHINIST, young; improver, saw bench or planer; good refs.; mod. s.; London pref.

1205.—ARCHITECTURAL DRAUGHTSMAN assists in preparing Contract or Competition drawings; 10 yrs. exp.; mod. charges.

1206.—ARCHITECT'S AND SURVEYOR'S ASSISTANT, age 22; 6 yrs. experience; working drawings, perspectives, surveying, levelling, tracer and colourist; mod. s.

1207.—QUANTITY SURVEYOR would manage branch for busy architect on sal. and profit sharing basis. Has small capital.

1208.—CARPENTER AND JOINER; 16 yrs. exp.; wants piecework, labour only or wkg. foreman; good refs.

1209.—PLUMBER, reliable; job or contract; sanitary work.

1210.—ARCHITECT'S ASSISTANT (24); good draughtsman; design working drawings, details, perspectives, specifications; 9 yrs. exp.

See p. xx for the Employment Register.

Privileges open to all Regular Readers of the "Builders' Journal."

I.—Free Monthly Advertisements.

1. A Free Advertisement of 12 words in the Wanted or Miscellaneous Advertisement Columns, in one issue of the BUILDERS' JOURNAL during each calendar month will be given to any regular reader.

2. The charge of one penny will be made for each additional word.

3. Advertiser's Name and Address or Box Number must be counted, but will in no case be reckoned as more than five words.

4. All advertisements must be accompanied by the correct remittance, and should a receipt be required a stamped addressed envelope must be enclosed.

5. The Proprietors reserve to themselves the right of refusing any advertisement.

II.—Free Answers to Enquiries.

1. The services of a large staff of experts are at the disposal of all regular readers who require information on architectural, constructional or legal matters.

2. Questions should in all cases be addressed to the Editor, and be written on one side of the paper only.

3. Correspondents are particularly requested to be as brief as possible.

4. The querist's name and address must always be given, not necessarily for publication

Note.—Owing to the large number of enquiries we receive weekly, we are compelled to restrict the advantages of this department to Regular Readers.

III.—Free Accident Insurance of £500.

1. Every regular reader of the BUILDERS' JOURNAL is entitled to the benefit of this Insurance.

2. A Pamphlet giving full details of this and other Insurance schemes inaugurated by the BUILDERS' JOURNAL for the benefit of its readers, and guaranteed by "The Ocean Accident Corporation, Limited," will be sent on application.

What is a Regular Reader?

We have employed the term "Regular Reader" throughout these announcements as the description "subscriber" is often understood to mean one who subscribes direct to the publishing office.

We mean by a Regular Reader anyone who has placed an order with us or any newsagent or bookstall for the BUILDERS' JOURNAL for one year.

Those readers who order the BUILDERS' JOURNAL through their local newsagent or bookstall should send us the newsagent's receipt. Their names will then be placed on our subscribers' list, and they will be entitled to all the advantages set out above.

**5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS.
OFFICE: 6, GREAT NEW STREET, FETTER LANE, E.C.**

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Annfield Plain (Durham).—For the erection of proposed Democratic club and institute in Front Street. Mr. Thomas E. Taylor, architect, Prospect House, Lanchester, or 2, Victoria Terrace, Annfield Plain:—

W. Ayton & Sons, Blackhill	£2,295 5 6
E. R. Davison,* Blaydon-on-Tyne	2,069 3 8
W. Collins, Annfield Plain	1,924 11 0
F. Ward, Lanchester	1,905 8 8

* Accepted.

Birmingham. — Accepted for the construction in Hennebique's patent ferro-concrete of the following works, for the Birmingham Corporation, in connection with the improvement of the River Rea at Saltley:—(1) Bridge and arching to Park Mills culverts, (2) 7ft. diameter barrel sewer and heads and outlets at Park Mills culverts, (3) additional arch to bridge on sewer farm, (4) bell-mouth to gasworks culvert:—

Yorkshire Hennebique Contracting Co., Ltd., East Parade, Leeds.

Cuxton (Kent).—For the erection of a new Council school, for the Kent Education Committee. Mr. G. E. Bond, architect, 384, High Street, Rochester:—

Gregory, Borough Green	£4,650
Pattenden & Son, London	3,455
H. G. Phillips, New Brompton	3,293
Lorden & Son, Upper Tooting	3,250
Avard, Maidstone	3,239
Davison, West Malling	3,100
Elmore & Son, Maidstone	3,088
W. Langridge, Snodland	2,999
Clark & Epps, Maidstone	2,994
C. G. Skinner, Chatham	2,982
Lonsdale, Swanley Junction	2,962
G. Browning, Canterbury	2,896
Friday & Ling, Erith	2,872
J. Wilford, Snodland	2,850
G. Wallis & Sons, Maidstone	2,838
G. West, Strood	2,828
A. J. Webb, Rochester	2,810
Kemp Brothers, Rainham	2,735
Patrick & Co., Rochester	2,700
W. Browning, Strood	2,700
L. Seagar, Sittingbourne	2,699
West Brothers, Rochester	2,543
G. Gates,* Strood	2,500

* Accepted.

Dundalk.—For the erection of municipal technical schools, for the Louth Technical Instruction Committee. Mr. M. Sellars, engineer and surveyor:—

J. Wynne	£4,053 0 0
J. McAdorey	3,996 0 0
J. McGuinness	3,904 14 4
McKee & McNally	3,900 0 0
W. J. Campbell & Son	3,780 0 0
Hutcheson Keith	3,584 0 0
T. McDonald,* Dundalk	3,291 4 0

* Accepted.

Isleworth. — For the erection of new secondary school for girls, for the Duke of Northumberland. Mr. H. G. Crothall, architect, The Guildhall, Westminster:—

Blackburn	£4,271 0 0
Waller	4,045 0 0
Kingerlee & Son	4,029 13 0
Heath	3,980 0 0
Godson & Son	3,873 0 0
Dickens	3,866 0 0
Goddard & Son	3,863 0 0
Mattock & Parsons	3,849 0 0
Minter	3,818 0 0
Wisdom	3,789 12 5
Dorey & Co.	3,699 0 0
Knight & Son*	3,433 0 0

* Accepted.

London, S.E.—For the erection of new section-house and married quarters at Long Lane, Bermondsey. Mr. J. Dixon Butler, architect and surveyor, New Scotland Yard. Quantities by Messrs. Thurgood, Sons & Chidgey, Charing Cross Chambers, Duke Street, Adelphi:—

Shurmur & Son	£19,942
W. Downs	19,735
Lathey Brothers	19,455
Lascelles & Co.	19,325
F. G. Minter	18,970
H. Lovatt	18,857
Perry & Co.	18,800
H. J. Williams	18,287
Holloway Brothers	18,280
Lawrance & Son	18,258
F. & F. H. Higgs	18,234
Mowlem & Co.	18,120
Higgs & Hill	17,984
Leslie & Co.	17,672
Grover & Son	17,538

London, N.—For the erection of an additional storey on the imbecile wards at the workhouse, Upper Edmonton, for the Guardians:—

J. Thomas, Enfield	£2,861
C. Wall, Ltd., Chelsea	2,680
Banyard & Son, Cambridge	2,650
A. Porter, Tottenham	2,613
Fairhead & Son, Enfield	2,609
Sands & Burley, Walthamstow	2,550
H. Knight & Son, Tottenham	2,521
A. Monk, Lower Edmonton	2,490
L. F. Lamplough, Notting Hill	2,471
L. & W. H. Patman, Enfield	2,450
W. Lawrence & Son,* Waltham Cross	2,438

* Accepted.

London. — For forming a basement 13ft. 6ins. deep under Neal's yard, and connecting to 41, Neal Street, for Mr. Joshua Morell. Messrs. Hayward & Maynard, architects, 20, John Street, Adelphi:—

McCormick & Sons	£1,978
Macey & Sons, Ltd.	1,665
Holloway Brothers,* Ltd.	1,500
T. Stevens	1,380

* Accepted.

Maidenhead.—For the erection of a new county police-station. Mr. Joseph Morris, county surveyor, Reading. Quantities by Mr. G. F. Lake, The Outer Temple, 222, Strand, W.C.:—

Batten Brothers, Reading	£13,508 10 0
J. Parsons, London	12,081 0 0
J. Ward & Son, Uxbridge	11,340 0 0
G. Pilgrim, Reading	11,050 0 0
Toogood & Co., Reading	10,852 10 0
Holliday & Greenwood, London	10,784 0 0
Turtle & Appleton, London	10,589 0 0
Fryer & Co., London	10,570 0 0
W. J. Dickens, Ealing	10,563 0 0
Martin Wells & Co., Aldershot	10,525 0 0
East & Hyde, Poinfield	10,516 0 0
W. R. Kisby & Co., London	10,480 0 0
George Kemp, Aldershot	10,464 0 0
Frank Bissley, Maidenhead	10,440 0 0
F. G. Minter, London	10,430 0 0
Speechley & Smith, Richmond	10,318 0 0
Silver & Sons, Maidenhead	10,188 0 0
J. K. Cooper & Sons, Maidenhead	10,130 0 0
William Creed, Maidenhead	10,128 0 0
Y. J. Lovell, Marlow	10,120 0 0
Hollis & Sons, Windsor	10,092 0 0
G. E. Wallis & Sons, Maidstone	10,114 0 0
T. Stimson & Sons, Wokingham	£9,992 11 7
Oak Building Co., Cambridge	9,986 0 0
F. Pizzey, Ascot	9,828 0 0
Walden & Cox, Henley-on-Thames	9,786 16 0
Rowland Brothers, Horsham	9,713 0 0
G. H. Tucker, Reading	9,620 0 0
William Watson, Ascot	9,618 0 0
William Hawkins, Reading	9,597 0 0
C. W. Cox & Sons, Maidenhead	9,596 0 0
H. D. Bowyer, Slough	9,584 0 0
G. Brown, Bracknell	9,577 0 0
G. H. Gibson, High Wycombe	9,547 0 0
W. Lawrence & Son, Waltham Cross	9,467 0 6
Henry Flint, High Wycombe	9,442 0 0
W. Stokes & Son, Reading	9,411 0 0
E. C. Hughes, Wokingham	9,376 0 0
A. Faulks, Reading	9,274 0 0
W. A. Wheeler & Co., Wantage	9,252 0 0
E. Fitt McCarthy, Reading	8,995 0 0
H. W. Godwin, Reading	8,987 0 0
A. J. Colbourne, Swindon	8,888 16 0

[County surveyor's estimate, £9,750 16s.]

Mountain Ash.—For the erection of 140 dwelling-houses, together with formation of streets, sewers and surface-water drains. Messrs. Morgan & Efford, architects, Aberdare:—

Davies & Co., Port Talbot	£38,500
Jones Brothers, Barry	37,100
Jones Brothers, Treharris	36,890
E. Williams, Dowlais	36,680
J. H. James,* Cardiff	36,106

* Accepted.

Saltash.—For alterations and additions to the "Railway Hotel," for the Plymouth Breweries, Ltd. Mr. E. M. Leest, M.S.A., architect, 14, St. Aubyn Street, Devonport:—

W. O. Alford, Saltash	£464 10 0
T. May, Plymouth	420 0 0
A. R. Smith,* Stonehouse	399 10 0

* Accepted.

Saltash.—For alterations and additions to "Dunheved House," for Mr. Pawley. Mr. E. M. Leest, M.S.A., architect, 14, St. Aubyn Street, Devonport:—

J. T. Brooking	£215
S. E. D. Ough	184
W. O. Alford	178
W. H. Rothery*	164

* Accepted. [All of Saltash.]

(*Continued on p.* xviii.)

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LONDON.

INSPECTION INVITED.

TENDERS—*cont. from p.* xvi.

Carlton Colville (Suffolk).—For alterations and additions, for the Reverend L. W. H. Andrews. Mr. Herbert J. Green, architect, 31, Castle Meadow, Norwich :—

Chaston & Grimson, Loddon	£885 19 0
W. J. Searle, Carlton Colville	815 19 4
C. R. Cole, Lowestoft	792 4 0
G. E. Hawes,* Norwich	701 18 0

* Accepted conditionally.

Petworth (Sussex).—For the erection of a block of three four-roomed cottages near Petworth, for Mr. E. Henne. Messrs. Barrett & Driver, architects, 23, York Place, Baker Street, London, W. :—

Bexall, Petworth	£400
H. Spooner, Loxwood, Billingshurst	392
Rowland Brothers,* Horsham...	350

* Recommended for acceptance.

Scunthorpe.—For the construction of a storage reservoir, erection of pump-house and offices, supply and erection of wrought-iron fencing, &c., for the Scunthorpe Urban District Council. Mr. Alexander M. Cobban, engineer, Home Street, Scunthorpe :—

Dawson & Son, Burnley...	£6,062
Parker & Sharp, York	5,252
Bower Brothers, Notts	4,980
C. Hollingsworth, Scunthorpe	4,972
Arundel's Exors., Bradford	4,600
H. Ashley, Mansfield	4,270
A. J. Thompson,* Scunthorpe	4,176
J. H. Dixon, Ketton	4,100

* Accepted. [Engineer's estimate, £4,870.]

Scunthorpe.—For the erection of new buildings and other works of levelling, paving, the supply and erection of new cattle pens, &c., for the Scunthorpe Urban District Council. Mr. A. M. Cobban, engineer, Home Street, Scunthorpe :—

Ashley, Mansfield	£2,345 0 0
Thompson	2,145 0 0
C. Hollingsworth	2,135 13 7
W. Pallister*	2,134 0 0

* Accepted. [Rest of Scunthorpe.]

South Molton (Devon).—For the construction and completion of works for water-supply in the parish of Chulmleigh, for the South Molton Rural District Council. Mr. F. B. Goddard, engineer :—

F. J. Stanbury, Devonport	£2,778 11 10
W. Parkin, Combemartin	2,506 14 11
S. W. Harrison & Co., Birmingham	2,485 8 9
F. H. Cooper, Chittlehampton, Devon	1,998 10 1
E. Pyke, Lynton, Torquay	1,604 14 3
Steer & Pearse, Plymouth	1,587 0 0
E. Harris, Clistbrydon, near Exeter	1,470 16 3
E. Tabor,* Cam Road Works, Cambridge	1,311 12 6

* Accepted.

Thornham (Norfolk).—For the restoration of north aisle, Thornham Church. Mr. Herbert J. Green, architect, 31, Castle Meadow, Norwich :—

John Cracknell, Peterborough	£436 0 0
Robert Dye, King's Lynn	387 9 6
Tath Langley & Co., King's Lynn ...	342 1 10
Reuben Shanks,* Hunstanton and Chatteris, Cambs	340 0 0

* Accepted conditionally.

Bankruptcies.

[Abbreviations : R.O.—receiving order ; P.E.—public examination ; C.C.—county court ; O.R.—official receiver ; Adj.—Adjudication.]

During the week ending June 23rd twenty-two failures in the building and timber trades in England and Wales were gazetted.

J. M. Statton, builder, Verwood. R.O. June 17th.

F. Wilson, builder, East Ham. Adj. June 13th.

C. Farley, builder, Acton. R.O. June 9th.

W. Elsdon, builder, Clapham Park. Adj. June 16th.

E. Warren, builder, Addlestone. Adj. June 13th.

J. Harley & Son, builders, Smethwick. Gross liabilities £14,539 ; assets £2,393 ; deficiency £6,678.

W. Riley & Co., timber merchants, Cardiff. R.O. June 9th.

J. C. Cree, builder, East Ham. R.O. June 13th. P.E., London Bankruptcy Court, July 19th, at 11.

W. J. Kenny, architect and surveyor, South Woodford and London. Adj. June 14th.

Whitehead & Saker, builders, Bromley. P.E., Croydon C.C., June 28th, at 11.

W. S. Gooderson, joiner and builder, Eastcote, near Pinner. R.O. June 16th.

C. Young, road contractor, Yarlington. P.E., Yeovil Town Hall, July 6th, at 12.

J. Godfrey, late builders' merchant, Tipton. R.O. June 15th.

Walley & Sons, builders and contractors, Stoke-on-Trent. R.O. June 16th.

W. Guest & Son, painters and plumbers, Dudley. Adj. June 8th.

W. S. Hildred, builder and slater, Hull. Gross liabilities £758 ; deficiency £747.

G. Hall, builder, Bloxwich. First meeting, O.R.'s, Wolverhampton, June 28th, at 10.30. P.E., Walsall C.C., July 12th, at 11.30.

W. C. Hodges, builder, Kempsey. R.O. June 15th. First meeting, 45, Copenhagen Street, Worcester, June 28th, at 11.30. P.E., Worcester Guildhall, July 18th, at 2.

H. Gilman, joiner and builder, Nottingham. Liabilities expected to rank for dividend £668 ; assets £388 ; deficiency £280.

W. Cheeseman, builder and contractor, Hull. Gross liabilities £28,847 ; £2,325 expected to rank for dividend ; assets estimated to be sufficient to cover this amount.

A. Ward, painter and paperhanger, Darlington. P.E., Stockton-on-Tees C.C., June 28th, at 10.30. First meeting, O.R.'s, Middlesbrough, same day, at 3.

G. Harber, builder, East Ham. First meeting, London Bankruptcy Court, June 28th, at 2 30. P.E., same, July 27th, at 11.30.

R. Brownley, joiner and builder, Chorley. First meeting, 19, Exchange Street, Bolton, June 29th, at 3. P.E., Bolton C.C., July 12th, at 3.

New Companies.

Madeley Coal, Coke and Brick Co., Ltd. Capital : £60,000.

William Austin and Co., Ltd., decorators, upholsterers, &c., 4, Suffolk Street, Pall Mall East, S.W. Capital : £15,000.

F. Smith and Co., Ltd., iron buildings and roofing contractors, Carpenter's Road, Stratford, London, E. Capital : £12,000.

Current Market Prices

OILS AND PAINTS.

Castor Oil, French ...	per cwt.	1 0 5	—
Colza Oil, English ...	do.	1 3 6	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 15 0	2 17 0
Lead, white, ground, carbonate	per ton	16 0 0	—
Do. red	do.	15 0 0	—
Linseed Oil, barrels ...	per cwt.	0 19 10½	—
Petroleum, American ...	per gal.	0 0 5¼	—
Do. Russian ...	do.	0 0 4⅞	—
Pitch	per barrel	0 8 0	—
Shellac, orange	per cwt.	7 0 0	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Town	per cwt.	1 4 0	1 4 6
Tar, Stockholm	per barrel	1 6 6	—
Turpentine	per cwt.	2 10 3	—

METALS.

Copper, sheet, strong ...	per ton	80 0 0	—
Iron, Staffs., bar ...	do.	5 12 6	8 0 0
Do. Galvanized Corrugated sheet ...	do.	10 12 6	10 15 0
Lead, pig, Soft Foreign...	do.	13 2 6	—
Do. do. English common brands	do.	13 7 6	—
Do. sheet English, 3lb. per sq. ft. and upwards	do.	14 0 0	—
Do. pipe	do.	15 0 0	—
Nails, cut clasp, 3in. to 6in.	do.	9 5 0	—
Do. floor brads... ...	do.	9 0 0	—
Steel, Staffs., Girders and Angles	do.	5 7 6	5 12 6
Do. do. Mild bars ...	do.	6 0 0	6 5 0
Tin, Foreign	do.	139 10 0	140 0 0
Do. English ingots ...	do.	140 0 0	142 0 0
Zinc, sheets, Silesian ...	do.	26 10 0	—
Do. do. Vielle Montaigne	do.	27 2 6	—
Do. Spelter	do.	24 0 0	24 7 6

TIMBER.

Soft Woods.

Fir, Dantzic and Memel	per load	2 10 0	4 15 0
Pine, Quebec, Yellow ...	do.	4 0 0	7 10 0
Do. Pitch, American	do.	2 8 0	5 0 0
Laths, log, Dantzic ...	per cu. fath.	4 0 0	6 0 0
Deals, Sandarne Yellow, 1st & 2nd, 3×8	per std	12 10 0	—
Do. do. do. do. 3×7	do.	12 10 0	—
Do. do. do. do. 2½×7	do.	12 10 0	—
Do. do. do, 3rd, 3×9	do.	12 5 0	—
Do. do. do. do. 3×8	do.	10 5 0	—
Do. do. do. do. 3×7	do.	9 10 0	—
Do. do. do. do. 2½×7	do.	9 10 0	—
Do. do. do. 4th, 3×9	do.	10 5 0	—
Do. do. do. 5th, 4×11	do.	8 15 0	—
Do. Blankaholm Yellow, 1st, 3×8	do.	9 5 0	—
Do. do. do. do. 3×8	do.	9 0 0	
Do. do. do. do. 2½×7	do.	9 10 0	
Do. do. do. do. 2nd, 4×9	do.	9 10 0	
Do. do. do. do. 4×6	do.	8 10 0	—
Do. do. do. do. 3×8	do.	8 15 0	
Do. do. do. do. 2½×7	do.	9 0 0	—
Do. Soderhamn, Yellow, 4th, 2½×7	do.	9 10 0	—
Do. do. do. 5th, 3×11	do.	8 5 0	—
Do. do. do. do. 3×9	do.	8 5 0	—
Do. Archangel White, 1st, 3×11	do.	13 10 0	—
Do. do. do. do. 3×9	do.	9 10 0	—
Do. do. Yellow, 4th, 3×11	do.	8 0 0	—
Do. do. do. do. 3×9	do.	8 15 0	—
Do. Swartvik, Yellow, 3×9	do.	6 15 0	—
Do. do. do. 3×7	do.	6 10 0	—
Do. Ornskoldsvik, Yellow, 3×9	do.	6 0 0	—
Do. Källskär, Yellow, 4th, 3×9	do.	10 0 0	—
Do. do. do. 5th, 3×9	do.	8 15 0	—
Do. Mesane, White, 2nd, 3×9	do.	8 0 0	—
Do. St. Petersburg, do. 1st, 3×9	do.	9 10 0	—
Do. do. Yellow, 3rd, 2½×11	do.	8 0 0	—
Do. Gamleby do. Unsorted, 3×7	do.	8 15 0	—
Do. Langrör do. 4th, 2½×7	do.	8 15 0	—
Do. Skelleftea Yellow, 1st, 2nd & 3rd, 2½×7	do.	8 10 0	—
Do. Riga, White, Unsorted, 2½×7	do.	7 15 0	—
Do. Amhurst, N.S. Spruce, Unsorted, 3×7	do.	7 5 0	—
Battens, all kinds ...	do.	6 0 0	13 0 0
Flooring Boards 1in. prepared, 1st... ...	per square	0 10 3	0 13 0
Do. 2nd	do.	0 10 3	0 9 9
Do. 3rd, &c.	do.	0 7 3	0 9 6

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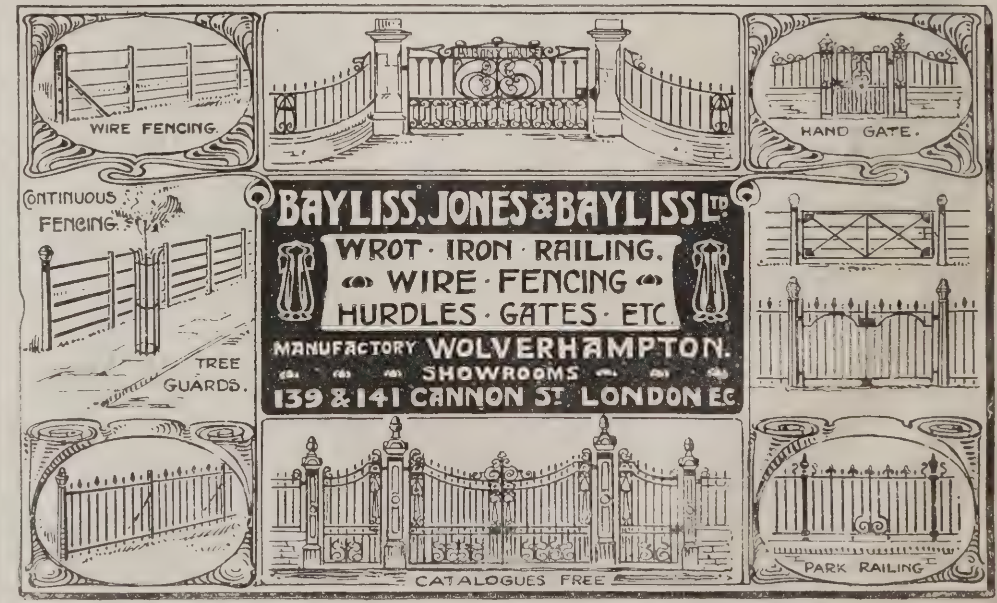

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